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Radio Control **CAR ACTION**

THE WORLD'S PREMIER R/C CAR MAGAZINE

47380



March 1992

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OFF-ROAD
NATS!**

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Radio Control CAR ACTION

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**ON
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COVER:**

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Nats. Left—the world's fastest R/C
car: Kent Clausen's record-breaking Associated
RC10L SS. (Photos by Yamil Sued.)

EDITORIAL

by FRANK MASI



At the '91 Chicago RCHTA Show, Team Losi won *Car Action's* coveted Car and Truck of the Year awards. Pictured at the trophy presentation are (left to right) Jammin' Jay Halsey, Janet "Mom" Losi, "Pops" Losi, Chris "Scissorhands" Chianelli, Jack Johnson, Gil Losi Jr., Gary "Uh-Oh" Kyes, Frank Masi and Li Agen.

I'VE JUST returned from the Chicago Radio Control Hobby Trade Association Show, and I thought I'd use my first "Editorial" as executive editor to share some impressions with you.

The R/C industry has changed significantly since I first became involved in it about 6 years ago. Unlike many industries, R/C hasn't been drastically affected by the recession. Instead, the tough economy has streamlined it. Many of the manufacturers who entered this industry to make a buck with inferior products are gone. The companies that offer useful, high-quality merchandise are still around. Also—and perhaps more important—many manufacturers (well, at least those who are in business for the long haul) think that the needs of entry-level R/C enthusiasts must be addressed quickly.

Too many of us are guilty of emphasizing the high-end racing segment of the hobby. The lure of the latest technology is very hard to resist, especially if you're a diehard racer. This "top-line-only" attitude has its place, but the truth is that we must attract newcomers and create racing classes that realistically limit the amount of money racers spend.

There's a surprising number of people who honestly think that the majority of R/C hobbyists race competitively. Our recent *Car Action* "Reader Survey" indicated that less than 40 percent of our readers participate in organized competition, and only 8 percent belong to a national sanctioning body such as ROAR. If I were a manufacturer, I'd sure like to get that other 60 percent involved in R/C racing, and maybe encourage them to join a sanctioning organization. It's up to everyone in the industry to motivate these individuals to become involved.

As I write this, Gil "Pops" Losi Sr. is working on a proposal for a racing series called "Formula 10." It will provide a national forum in which beginner and unsponsored drivers can compete. I hope this racing series will get the ball rolling, and I wish Pops the best of luck with it. I also hope that other manufacturers will follow his lead. ■

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R/C REGURGITATION

In the October '91 issue (pp. 154-155), you "strongly" advise against using a Futaba MC112B with a Trinity Monster Mash motor based on the manufacturers' recommendations. I've used this combination successfully for more than two years. Why don't you test it, and then make recommendations based on your experience? If we want manufacturers' recommendations, we'll ask for them. You're supposed to provide additional information and insight, not regurgitate information that's already available.

D. GARRON
Weston, MA

D., I'm sorry that you don't think we

conduct our own tests, because we do. We're just as R/C-crazy as most of you. I own a Futaba MC112B and an MC111B, which has a higher capacity. I've run both of them with modifieds for quite a while, although I haven't used them with a Monster Mash motor.

From what I've observed, the MC112B gets too hot when you run it with some modified motors. If the heat doesn't bother you, fine. To me, however, this heat is wasted energy. This ESC can probably hold up to the Monster Mash but, based on my experience, there are better options. JH

R/C MOTO-CROSS

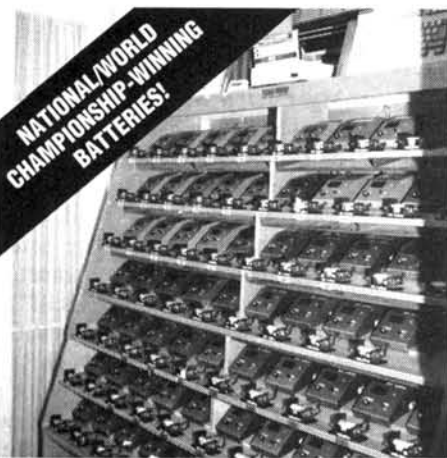
I'm just starting in R/C racing. Is the Losi

Junior T is a good truck for beginners? My friend told me to buy the more expensive, upgraded JR-XT truck. Are R/C trucks easy to build? Also, I know there are on-road motorcycles such as the FZR-R 750R, but are there any off-road bikes?

ERIC KAY
Naples, FL

Eric, I think you should go for the Junior T. It's similar to the JR-XT, and it is less expensive. Its chassis is the same as those used by most of the Team Losi drivers these days. The only modification you might want to make is to replace the wheel bushings with ball bearings. Later, if you want to hop-up the Junior, you can just

(Continued on page 10)



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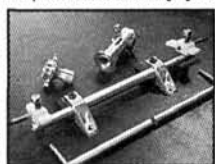
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LETTERS

bolt the JR-XT parts right onto it.

As for the assembly, check out Team Losi's video, "Doing It Right." It's included with the Junior Two and the Junior T! How much easier can it get? As far as we know, there are no off-road R/C bikes. Although we tried the new Royal Hyperspeed bike off-road, it didn't do very well. This bike does, however, go like crazy on smooth pavement. JH

REDUCED RUN TIME

I have an RC10 with a two-month-old Joel Johnson stock motor and a Futaba MC112B ESC. I also have old batteries and an old charger. I don't get good run times with this combination (maybe 2 or 3 minutes—3 1/2 if I'm lucky). I assume this is because of my batteries or my charger. Should I replace them? Is a peak charger better than a regular one? I can't get both. Long live Car Action!

AARON THURSTON
Huntington Beach, CA

Aaron, get yourself a new charger. Although it won't solve all your problems, a good peak charger (e.g., the Tekin BC 210 with ProFlex circuitry) will extend your run times by ensuring that your packs are fully charged. There are other things you can do. Check your motor for wear. If it's two months old, there's a good chance that it's dirty, and its brushes may be worn. Having more battery packs might also help. Not only will the car run better with a fresh set but, if you have more than one, each will have more time to "rest" between charges. Start with the new charger and, as your bankroll allows, pick up some new packs. JH

HEAVY-DUTY HELP

I've been trying to decide which radio system to buy for my Bullhead, but only the Futaba systems seem to come with heavy-duty servos. Can you give me the names of some other radios and the companies that manufacture them?

Also, I can't decide on an ESC. I'd like

to buy either the Novak 610-RV or the PDI Turbo Zeta. Which one can handle Trinity Matched Madness motors? Who makes turnbuckles for the Junior T?

TIM GAYLORD
Plano, TX

Most radio manufacturers offer heavy-duty servos as optional equipment for their higher-quality radios. Check out Airtronics, JR and KO Propo. (What do you have against Futaba, anyway?) Your local hobby shop might be able to create a custom package for you at little or no extra cost.

Both the 610-RV and the Turbo Zeta can handle Matched Madness motors—take your pick! As for your Junior T, Team Losi makes steel turnbuckles for it, and Lunsford, R/C Performance Specialties and Tecnacraft make titanium ones. LA

HE LIKES US!!

My Futaba MC112B ESC got fried. I want to send it to the manufacturer, but I don't have the address. Do you?

I thought your interview with Cliff Lett was really thorough. I talk about him so much that my friends are going insane. He's great, and I'd love to meet him! Why not interview Chris Chianelli? I'd like to know how he got started in R/C and how he ended up working at Car Action.

Last, but most certainly not least, I'd like to thank all the men and women at Car Action for coming into my life. You'll never know how much easier you've made life for me. Thank you.

BRIAN FRITZ
LaFayette, CO

Thanks for the kind words, Brian. You can send your controller to Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

We can't stop talking about Cliff either, but nobody in the office seems to mind. If you want to meet him, I have it on good authority that he'll be at the Pomona (California) Show on March 13 through 15—definitely worth the trip from Colorado.

An interview with Chris? Not a bad idea. So what about it, Car Action readers? Given the chance, what would you ask Chris "Scissorhands" Chianelli? (I'd certainly like to know when he last took a shower....) LA

A COUPLE OF QUESTIONS?!

You guys run a great magazine. Here are a couple of questions to challenge your feeble (or superior??) minds.

- At what amperage are pushed packs charged and discharged, at how many cycles, and is it possible for me to do it with a Turbocharger and "the dumpster"? Is it true that well-cared-for pushed packs don't last as long as well-cared-for regular matched packs?

- What should I do with old shock oil, motor bath, old cells, and other things that might be harmful to the environment? I know that pouring the liquids down the drain, or throwing the cells into the trash isn't the answer....

- How do I know when it's time to change the clutch disk in the Stealth slipper clutch?

- In the August '91 issue, it was stated that Masami made a special steering rack to avoid Ackerman effect. I thought Ackerman effect improved steering. The servo he used certainly had enough power to straighten the steering if it locked up. On my team car, I use RPM bellcranks with 25-degree caster blocks and a Futaba 132H servo. There's severe Ackerman effect, yet the steering hasn't locked up, and the car's steering is wonderful. So what's the deal?

Thanks for your time, and keep up the outstanding work!

JEFF CHERG
Alexandria, VA

Wow, Jeff! A couple of questions? Well, I won't waste time with idle banter.

- Usually, pushed packs are charged at 5 amps and discharged at more than 30 amps. The number of cycles the cells are put through varies from manufacturer to manufacturer. I don't think it's possible

(Continued on page 87)

New In '92

RC-10 and RC-10T

2003 RC-10 Telescoping Drive System w/H-Arm for Stealth **64.95**

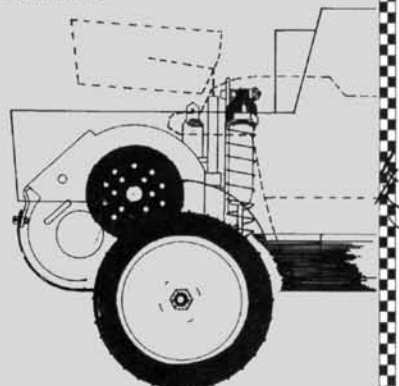
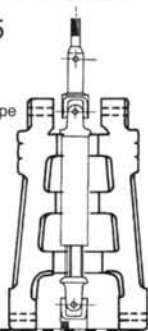
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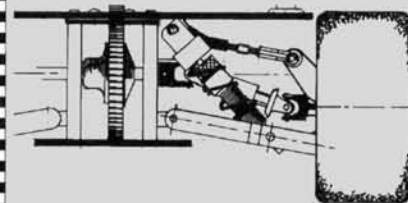
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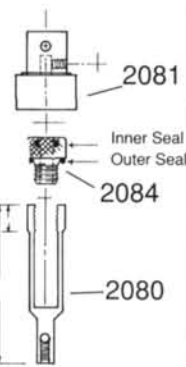
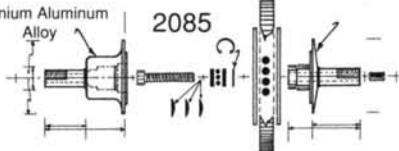
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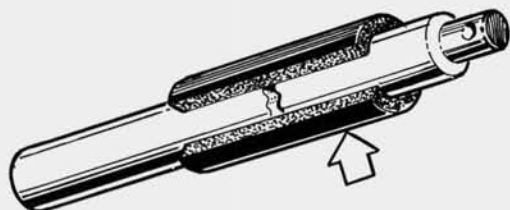
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PIT TIPS

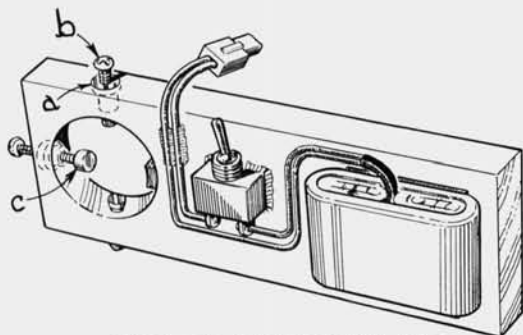
by JIM NEWMAN



QUICK BODY-MOUNT REPAIR

Here's a way to quickly repair snapped body mounts at the track. Slip the broken parts into a short piece of rubber hose as shown. Such hoses are available at most service stations; or you could carry a small piece in your field kit—just in case. (Note: the hose is drawn with an opening in its side so that you can see inside.)

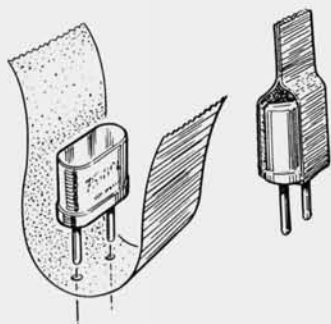
Scott Baker, Wyoming, NY



MOTOR BREAK-IN JIG

In a $3/4 \times 3 \times 11$ -inch wooden block, cut an oversize hole to accommodate a motor. Hot-glue a switch to the block, and mount a suitable Ni-Cd pack next to it with Velcro®. You can insert a plug into the leads (next to the pack) to facilitate removing the pack. Glue the plastic anchor nuts (a) into the block so that the screws (b) will protrude through the hole in three places. To prevent damage to the motor case, the screws have plastic endcaps (c). The motor is pressed against a piece of padding that has been glued inside the hole. The connector goes to the motor.

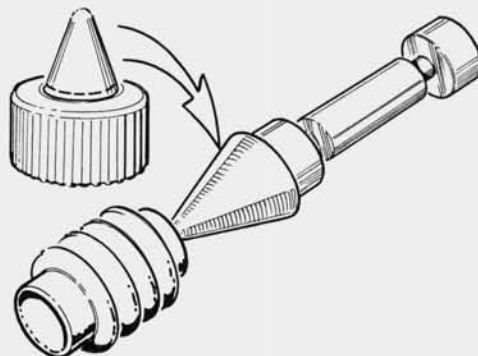
Bruce Turner, St. Lucie, FL



CRYSTAL PULL TAB

Wrap a piece of tape around the crystal before you insert it. Now, it's easy to remove—just pull the tape tab.

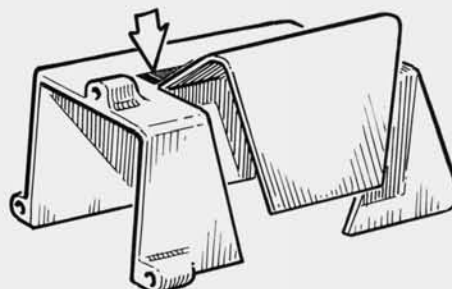
Jeff Pieper, Strasburg, IL



DRIVE-SHAFT MANDREL

Slice the point off a glue-bottle cap, and press it onto the end of the drive shaft. Use a little silicone grease on this pointed mandrel, and the rubber bellows will slip easily over the shaft.

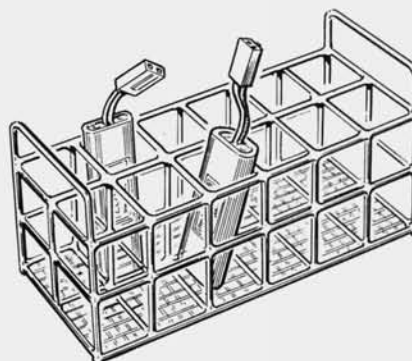
Wayne Dry, Durham, NC



BLACKFOOT SERVO ACCESS

Cut through the servo cover as shown; then hinge the section you've cut away with vinyl tape. This eliminates the need to remove the screws and the straps every time you want to access the servo. Secure the cover with vinyl tape.

Mitya Lurie, Paxton, MA



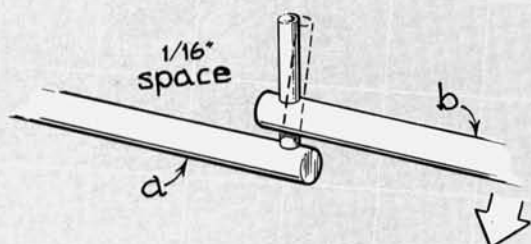
BATTERY-PACK CARRIER

Ask an appliance repairman for a discarded utensil basket from an old dishwasher. These compartmental baskets are made of plastic-coated wire, and they're ideal for transporting your Ni-Cd packs. Their open construction provides the packs with plenty of cooling ventilation.

Mark Kaiser, Austin, TX

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

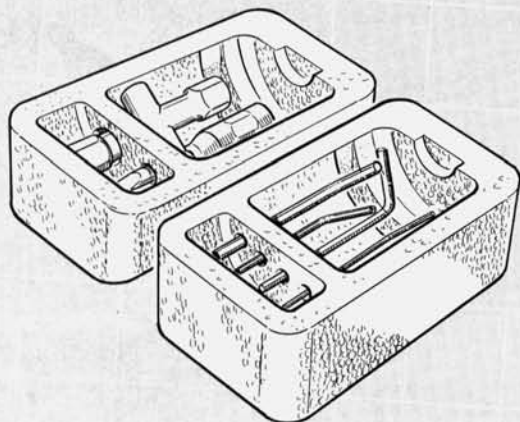
PIT TIPS



KINGPIN CAMBER ADJUSTER

If you own a car with a front-beam axle, don't throw away the old, bent front beam. Use it to adjust the camber to your liking by safely tweaking the kingpins. Just slip the beam over the kingpin (allow $1/16$ inch of space underneath), and then bear down on the beam to bend the pin outward slightly.

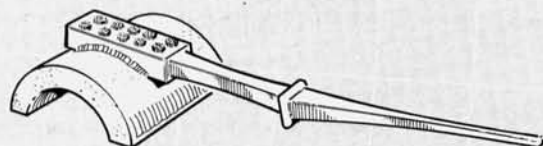
Bruce Triplett, Augusta, GA



MINI PIT KIT

This kit is made from the foam box that was used to package a Monster Marine motor. Just drill a few holes in it, and insert your Allen wrenches, speed-controller adjuster, lug wrench, spare crystal, etc. You can even slot one end of it to accept a container of diff lube! Secured with tape or a rubber band, you can easily slip this handy little kit into your pocket.

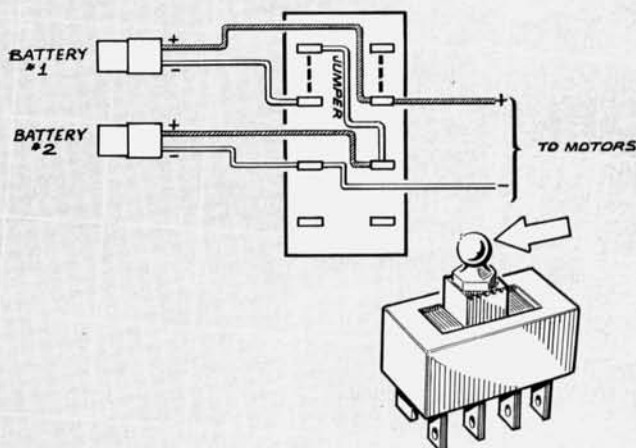
Jimmie Wilson II, Boys Town, NE



SMALL PARTS FINDER

Cut the bristles off a discarded toothbrush; then hot-glue it to an old motor magnet. This tool is great for reaching under cabinets, etc., to find steel screws, washers and nuts.

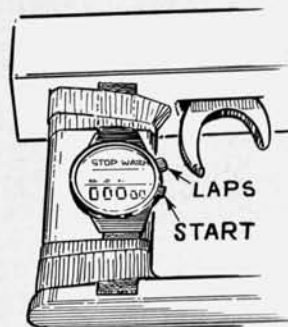
Ken Bueckman, Millstadt, IL



SIMPLE, TWO-SPEED CONTROL

Wire a three-pole switch as shown. (They're available at Radio Shack, or you can salvage one from an old hair dryer.) Drill a small hole in the top of the knob, and glue a balljoint in it, which can be connected to the motor servo. The switch enables you to use one 3-cell pack for slow speed or two 3-cell packs in series for full speed. You can also get some real thrills using two 6-cell packs. Just don't forget the jumper wire; it's very important.

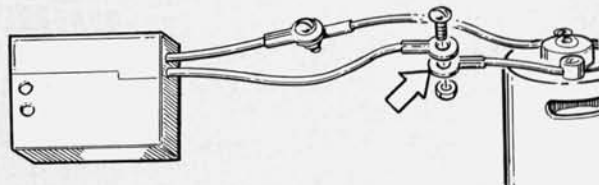
Rusty Carver, Jacksonville, FL



BUILT-IN LAP TIMER

Cut the straps off an old digital watch, and tape it to the pistol grip of your transmitter. With a little practice, you'll soon be able to operate the push buttons with your free hand.

Mark A. Moeller, Cedar Rapids, IA



NON-FRYING CONNECTORS

If your motor plugs overheat, try this. Bolt two eyelet-type connectors (available at Radio Shack) together, and cover them with insulating tape or insulating sleeves. Notice that the connectors aren't positioned directly opposite each other. This safety measure prevents one connector from shorting out the other if the insulation is damaged.

Mathew Friggle, Toms River, NJ

INSIDE SCOOP

by CHRIS CHIANELLI

SPECIAL CHICAGO EDITION

This time, I was off to that model industry mecca, the RCHTA (Radio Control Hobby Trade Association) Chicago Model Hobby Show. I went, I saw, I drooled. The Ayatollah of Radio Controlla, our Group Publisher Louis V. DeFrancesco, has ordered me to report the news, no matter how it may shock the free world. The Great One's exact words were, "So shall it be done, so shall it be written—you complete and utter buffoon!"



TAMIYA TAKEOVER

After two years of planning, Tamiya has established Tamiya America Inc. Its new facility will be located in Aliso Viejo, CA, and Masayuki Tamiya is the new company's president. As of July, 1992, Tamiya distribution, sales and service operations will no longer be handled by MRC and will officially be moved to Aliso Viejo. Joe Samaria, vice president of marketing and sales, told me that having a corporate identity in the U.S. will improve Tamiya's ability to respond to the needs of American R/C enthusiasts. The commitment of Tamiya America Inc. is obvious. This move promises a bright future for Tamiya and the R/C industry as a whole.

FULL-SCALE

Besides checking out all the hottest releases at the 1991 RCHTA show in Chicago in November, part of my job was to meet the truly important individuals on the racing scene; hey, somebody has to! When Colt Cobra felt that the Big Foot clan "dissed" him (they failed to recognize his need to swallow whole, live rodents just before "crush-time"), he left the team, vowing venomous vengeance. He has since returned to the crushing game with the Snake Bite, displayed here at the Parma International booth. Parma has a new, 1/10-scale version of this bone-crunching truck. I was very flattered when Colt Cobra asked me to slip into the driver's seat—*his* seat! It's not every day that an angry Cobra invites you to wear his skin! That's not the peace sign Colt is giving. He's thinking of sinking his sharpened fangs into his archenemy, Big Foot.



VENOM





The people at CRP have been trying to get a government contract for their automated vacuum cleaners to work around the clock in hallways and around document shredders. Project Engineer Gary Crawford says the experimental RoboVac, which isn't available to the public, has 12 preprogrammed vacuuming patterns; it's not R/C. A microprocessor with a series of sequenced, timed events, e.g., left turn, forward 5 seconds, backward 4 seconds, etc., controls it. Should the nozzle hit a wall or furniture, the pattern program will restart. RoboVac weighs 16 pounds and has auto shutdown (in case it gets wedged under a coffee table). Recent leaks inform me that CRP is working on RoboMop.

NEWS FLASH!

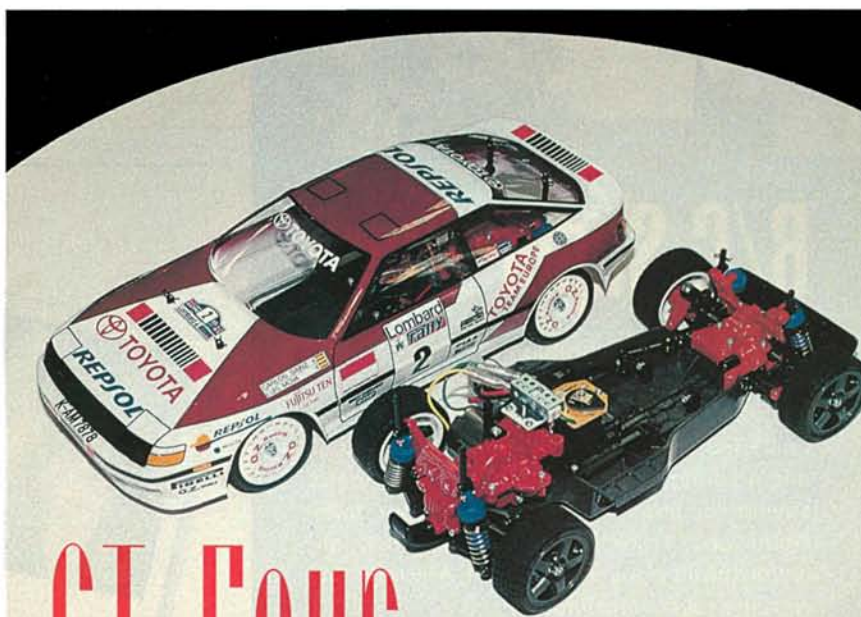
MOTOR BUYERS BEWARE! IT MAY NOT BE LEGAL

A published report that referred to the practice of armature-shortening, i.e., removing laminations from the armature end to increase performance, has prompted ROAR to redefine its stock-motor specs. Although the motors featured in the report (B&R's .22 and .44 Magnums and Reedy's True Stock) were wound with 27 turns of 22AWG wire, less wire actually ended up on the shortened armature. ROAR has now specified that there must be 64 inches of wire on the arm—no more, no less. Although these are high-quality motors, they're not legal. ROAR has taken this action to avoid yet another "hot motor of the week" battle. The companies involved are currently meeting to compromise on a wire length. We'll keep you posted.



NIKKO

Nikko America Inc. was a strong presence at the Chicago show. On the left, the company's Advertising/Creative Director, Marsha Cathey, is holding the new 1/10-scale Porsche 959. It comes fully assembled and includes a radio. On the right is one of Air Age's Advertising Account Representatives, Mike "RoboPest" Stankiewicz. Marsha says Nikko is making a new effort in the 1/10-scale arena for 1992.



GT-Four

MRC/Tamiya's new 4WD Toyota Celica GT-Four Rally car has a shaft drive and uses the Mercedes tub chassis with all-new front and rear diffs. The 7-inch-wide car's wheelbase is 10 1/4 inches. We're working on a review of the Nissan Skyline GT-R Nismo, which uses the same chassis as the Toyota, so stay tuned.



BIG FLAT NOSE

MRC of France has released this beautiful 1/5-scale Porsche 911 flat-nose that's powered by a pull-start Kawasaki TG 24cc ignition engine. The 22-pound car has rear-wheel drive, a planetary diff and double-wishbone suspension all around. If you think you're interested, let me know. I'll see if I can talk one of the importing honchos into bringing it in. Be warned: it ain't cheap!

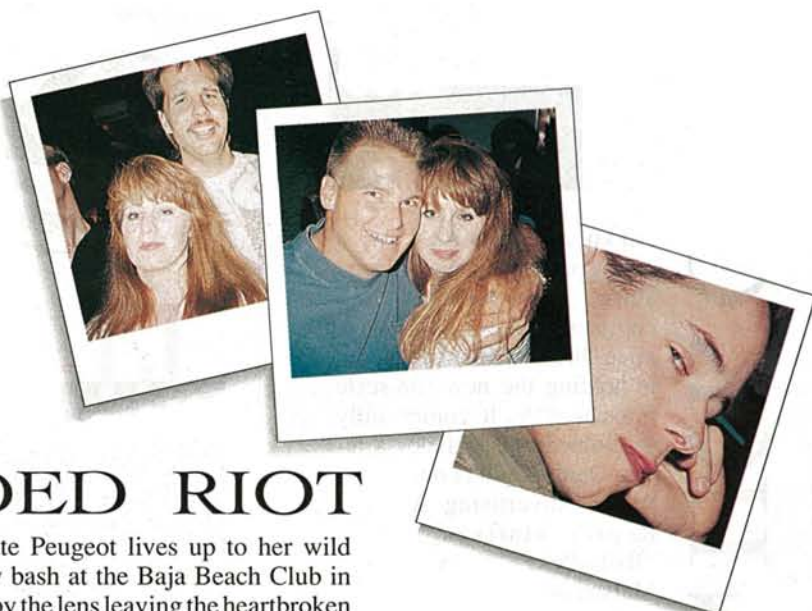


The 1/5-scale Mugen 911 has T-6 aluminum tube frame, which is very rigid and light. It's powered by a 24cc pull-start Kawasaki.



R/C Super Bowl

"RoboCop" Jim Thornton—tight-end for the Chicago Bears—is a race-truck fan. Here, he's racing against me (foreground), Team Losi's Gary Kyes (with the beard), Pops Losi and a young challenger who was overheard saying to Jim, "I'm gonna kick your butt, RoboCop." Truck racing has obviously affected the little guy's judgement. Anyway, Jim won the race—lucky for us!



REDHEADED RIOT

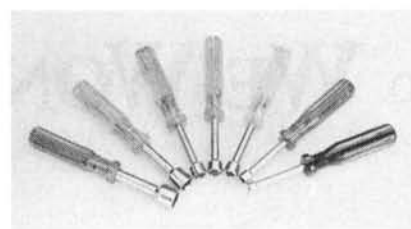
World-famous R/C groupie Brigitte Peugeot lives up to her wild reputation at a post-RCHTA Show bash at the Baja Beach Club in Chicago. Miss Peugeot was caught by the lens leaving the heartbroken Jumpin' Jack Johnson for her latest love interest, Joel "Magic" Johnson. *Car Action's* Executive Editor Frank Masi seriously considers changing his last name to Johnson.



1

Differential Lubrication

You should rebuild your differential when it feels gritty—that's frequently, if you race a pan car. Keep a selection of brands, as each has a particular consistency that will affect diff operation in a variety of ways.



2

Allen Wrenches and Nut Drivers

These are also essential. Allen wrenches are usually provided in kits, but kit wrenches are often of low quality and tend to strip easily. A set of high-quality L-handle wrenches shouldn't cost more than \$10, so there's no excuse not to buy some. Bondhus* wrenches have a special pivoting tip that allows you to insert an Allen wrench at any angle up to 25 degrees.



3

CA Glue

Instant glue has to be one of the best things ever invented. Not only does it dry quickly, but it's also extremely strong. Several varieties are available: quick/thin, slow/thick and varieties for gluing plastics. Its uses include gluing tires to rims, repairing bodies, securing diff rings, repairing graphite chassis, gluing peoples' feet to the drivers' stand, etc!

25

TOP TOOLBOX ITEMS

by ALEX STROUTHOPOULOS

THERE ARE CERTAIN requirements for successful R/C racing. You need a car, a radio, a battery, a battery charger and tools. When it comes to the first four items, most people have a very good idea of what to buy, but which tools are the most useful? You don't want to take a drill press to the track, but what do you need? We put our heads together, looked through our pit boxes, and came up with a list of 25 items that we deem essential.



4

RPM Parts Tray

Put RPM's* parts tray next to your work area and throw body clips, screws and other small parts into it. When it's time to put your car back together, all the parts are in one place. Metals will stick to the small magnet that's molded into the tray. Imagine never again having to crawl on the floor to look for that lost motor screw!



5

Ruler

A ruler is one of those things that we can't live without. Use it to measure such things as tire diameters, ground clearance, body-post holes and spring settings. The best one is a 6-inch flexible plastic ruler that has metric rulings on one side. It's small enough to fit into any pit box, but large enough to meet all your measuring needs.



6

Soldering Iron

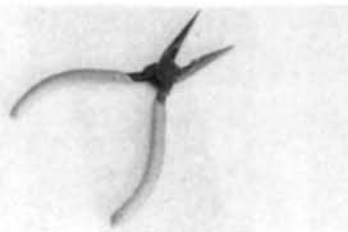
If there's one item you should really splurge on, it's a high-quality soldering iron. Buy one with a rating of 35 to 45 watts to suit most R/C applications; soldering with a less powerful iron leads only to frustration. Good-quality irons are available from Radio Shack, Ungar* and Weller*.



7

Paper Towels

Don't go anywhere without them! Their uses include: body cleaning, shock cleaning, cleaning up spilled coffee, etc.



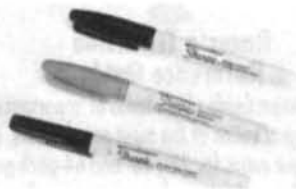
8 Pliers

Keep a high-quality pair of pliers in your box at all times. Its uses range from grasping shock bodies when tightening caps to holding wires in place when soldering. If possible, arm yourself with both a standard pliers and a needle-nose pliers.



9 Kyosho Scissors

These curved Kyosho® scissors are perfect for trimming bodies, or cutting wires, servo tape, or decals. Their curved tip makes getting into tight spots easy. They're also great for cutting off the knobbies on off-road tires.



10 Sharpie Marker

Another must-have item. Whether you're detailing a body, marking a hole to be drilled, counting teeth on a gear, or writing down a telephone number, the Sharpie permanent marker is king.

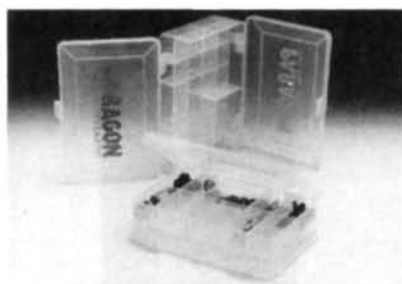


11 Motor Brushes

It's a good idea to have a selection of replacement brushes in case yours wear out or fail at the track. The type that you use most often might not be available at the track, so don't take chances—take your own.

25

TOP TOOLBOX ITEMS



12 Paragon Parts Organizer

After you've built a few car kits, you may notice that screws and nuts start to overrun your work area. When this happens, it's time to buy a parts organizer. Paragon® manufactures a perfect box that's small, yet will hold more screws than you'll ever have. The organizer is made of durable plastic, is divided into compartments and will keep the screws and nuts separated even if the box is turned over.



13 Discharge Light Bulbs

Often, your battery will still have some charge in it after you've raced. Wire 12, 2A automotive light bulbs in series, and you'll have a 24A discharger. When you discharge your batteries, you'll be able to see how much run time you have left by timing how long the bulbs stay lit. Check the August '90 issue of *Car Action* for Steve Pond's article on how to build one.



14 Files

Most people forget files when they put together a toolbox. Files are great for fitting parts, contouring brush shapes and enlarging or shaping holes. Standard varieties include round, needle and flat files.



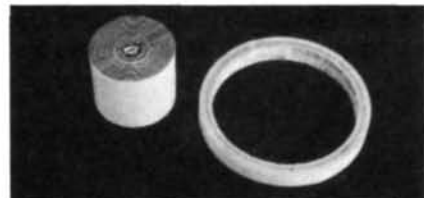
15 Pinion Caddy

When it's time to go up a tooth on your motor, the last thing you should be doing is digging through a pile of pinions! Keep them in order on a pinion caddy. It will not only keep them in better condition, but it will also make identifying them a breeze.



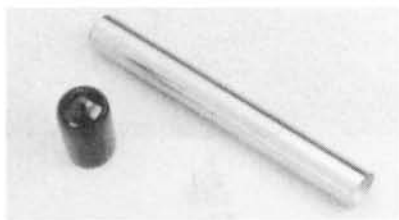
16 Toothbrush/Hand Brush

No one looks forward to cleaning his car between rounds. Use a stiff-bristle toothbrush to clean it out. Tires, on the other hand, tend to collect lots of dirt that's very hard to get rid of. A stiff hand brush works best.



17 Strapping Tape and Double-Sided Tape

Everything from speed controllers to receivers, switches, servos and spoilers can be mounted with double-sided foam tape. Strapping tape is great for securing cells to your car chassis. It's cheap, strong and light, and it's also invaluable for repairing your car after a major encounter with a wall.



18

Body-Hole Punch

A jagged body-post hole just won't cut it any more: today's cars are way too trick for that! But how can you make accurate holes every time? It's easy with a hole punch. Trinity and RPM offer punches that will make a neat, 1/4-inch hole.



19

RPM Camber Gauge

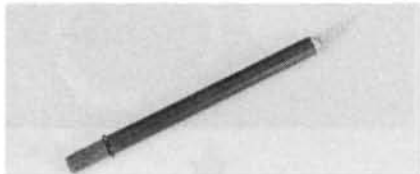
We keep finding new uses for the RPM camber gauge. Although it was designed for measuring camber, it will also measure toe-in and caster. It's marked in 1-degree increments from +10 to -10 degrees. A plastic knob allows you to securely lock the setting.



20

Screwdrivers

Think back to the last kit you built, and try to think how far you would have gone without a screwdriver. Step one? We thought so. A high-quality screwdriver will fit perfectly and won't damage soft aluminum screws. Have some small ones for those intricate jobs as well as a few larger, stronger ones.



21

X-Acto Knife

The person who invented the X-Acto knife should be given a medal. We've used ours to do many things, from trimming wheel wells to cleaning a grain of sand out of a gear. We always have one close at hand. Make sure that you buy extra blades; believe us, you'll need them.

25

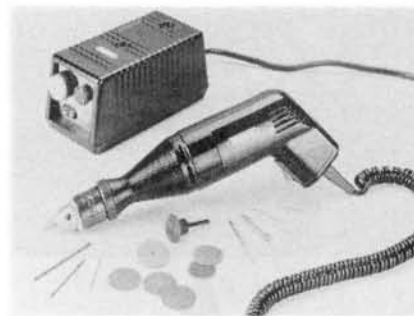
TOP TOOLBOX ITEMS



22

Motor Spray

We're always running out of this stuff! Motor spray is an indispensable all-purpose cleaner. It's great for cleaning motors, shocks, ball bearings and hinge pins. Several manufacturers make good-quality motor sprays. For a safe bet, stick to Bel-Ray*, Dan's*, Trinity*, or Reedy*.



23

Minicraft Power Tool

The versatile Minicraft* power tool is great for those small jobs where a hand drill is just too big. This rotary tool makes cutting, sanding, polishing and grinding easy. It has variable speed and comes with a selection of bits and a chuck key. Other attachments allow you to use it as a router or as a lathe.



24

Car Action Stopwatch

When we arrive at a new track, we always time the local fast guy to see how quick his lap times are. The Car Action SC-800 Chronometer makes this easy. It allows us to keep track of the number of laps completed, how fast they were, the fastest lap and the average lap time. The SC-800 also has a countdown timer that ensures that your car runs for a full 4 minutes.



25

Racer's Traxside Reference Guide

Our Car Action Guide offers loads of important racing info: gear ratios of the most popular cars, pinion and spur ratios for 32-, 48- and 64-pitch gears and ROAR specifications for most types of racing are all included. The guide is included with the November '91 issue of Car Action.

*Here are the addresses of the companies mentioned in this article:

Bondhus Tools, 1400 E. Broadway, Box 660, Monticello, MN 55362.

Ungar, 5620 Knott Ave., Buena Park, CA 90621.

Weller; distributed by The Cooper Group, P.O. Box 728, Apex, NC 27502.

RPM, 14978 Sierra Bonita Ln., Chino, CA 91710.

Paragon Racing Products, 690 Industrial Circle So., Shakopee, MN 55379.

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

Bel-Ray; distributed by HLR Products International, 100 Walnut St., Champlain, NY 12919.

Dan's RC Stuff, 9525C Cozycroft Ave., Chatsworth, CA 91311.

Trinity Products Inc., 1901 E. Linden Ave., Linden, NJ 07036.

Reedy; distributed by Associated, 3585 Cadillac Ave., Costa Mesa, CA 92626.

Minicraft, 1 Perfection Place, Ridgely, MD 21685.

READERS' RIDES

"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If the Ayatollah chooses your photo, you'll receive a one-year subscription to Car Action, or an extension to your existing subscription. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1992. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



■ LOSI ON WHOLE WHEAT

From the fertile mind of Luis James of Mountain View, CA, comes this Losi combo, hold the mayo. Luis races both the JRX-Pro and JRX-T regularly. The Pro is outfitted with a Novak ESC and an Airtronics radio; the truck is controlled by a Tekin ESC and a Futaba radio. The vehicles have Cam motors, PTI batteries and identical, spray-painted bodies.



■ AIRBRUSH ARTISAN

Leon Fahrenthold of Anchorage, AK, was obviously born to paint. He went to work on a clean body with nothing but an airbrush, and now he has the best paint job around! That magnificent artistry covers a super-trick JR-XT that's equipped with a Tekin 411p ESC, an A&L slipper clutch, Lunford titanium rods, Racers' Choice ceramic diff balls and RPM long suspension arms. A fully customized interior rounds out the package.



■ ALL IN THE FAMILY

TNT Motorsports (Don, J.P. and Joey Tihery) is a father-and-sons racing team from Painesville, OH. Dad (Don) races the Quaker State RC10L, J.P. has the Goodwrench machine, and Joey drives the Western Auto racer. All TNT racers run the 10Ls on carpet and the RC10s on dirt ovals. In their first eight-week points series, the trib finished 2nd, 3rd, and 4th! Watch out, Team Associated!



■ MORK MACHINE

Chris Purbough of Glendale, CA, is responsible for this...this...well, *this*! Based on an RC10, this alien machine is outfitted with an Airtronics radio and a body made out of an "odd-shaped piece of Lexan." Odd is *definitely* the operative word here.



■ MARVELOUS MURRAY

Murray Harris of West Valley, UT, loves his RC10 Team Car. He has hopped it up with a Cobra Venom 24-degree stock motor, a Nevak 410.M1c speed controller and micro-receiver, and Lunsford titanium tie rods and hinge pins. What's more, our "Painting Lexan Bodies" series inspired Murray to paint this car himself—a first! We're impressed.

KYOSHO USA-1 NITRO Crusher

by E D S C H E N K

DO YOU HAVE what it takes to run the most radical, the most powerful, the most outstanding R/C truck on four scale wheels? Are you ready to graduate from the school of electrics and take your first class in gas—Nitro 101? Can you handle a .21 2-stroke, dirt-pounding, nitro-burning, aluminum-chassis, shaft-driven Kyosho® USA-1 Nitro Crusher? If you answered “yes” to all of the above, then you’re ready for the roughest, loudest, gas-powered ride you’ve ever had!

THE KIT

The USA-1 Nitro Crusher is modeled after its cousin, the Kyosho USA-1—a twin-motor, electric-powered monster truck. They both have the same polycarbonate body; huge 6.5-inch rubber tires; oil-filled, coil-over

shocks; and aluminum shock towers and decals, but that’s where the similarities end. The USA-1 Nitro Crusher has an aluminum chassis instead of the electric version’s plastic tub chassis. The shock towers are positioned laterally across the chassis, and it’s powered by a .21 2-stroke engine (not included). Unlike the electric USA-1, the Nitro Crusher doesn’t have 4WS, but with this truck’s speed, power and weight, it isn’t a practical option. Also included are a gas tank, a muffler, lower body dirt guards, a shaft drive to the front and rear wheels and a gear reduction for the massive tires.

To assemble this truck, you’ll need a heavy-duty steering servo, a .21 2-stroke buggy engine, a 2-channel radio and a good supply of threadlock! The engine makes the chassis vibrate significantly, so use a generous amount of threadlock on all appropriate screws. You may also want a Ni-Cd, 5-cell receiver pack. I replaced the stock screw-top tank with a Kyosho Turbo Burns quick-fill tank.





ASSEMBLY

I was impressed with the kit's contents. The gearboxes were already assembled, and there were a lot of gleaming aluminum parts. The chrome wheels and rubber tires were huge (they took up half the box!), and the number of part bags looked manageable.

The instruction manual is very detailed and concise. Assembly begins

with the eight oil-filled shocks and the front and rear suspension arms. You have to trim the rear hubs to clear the inside rims—an irritating job that Kyosho should address. Cutting the hard plastic is potentially dangerous. I wound up scoring the cut line with an X-Acto knife, then I used pliers to snap the plastic on the scored edge.

The rear shock installation and



the front gearbox assembly are next. Make sure your differential works smoothly before you mount the gearbox on the chassis. After you install the front suspension arms and the shocks, assemble the center differential. For this tricky, critical process, you must leave *exactly* 8mm around the brake disk. You don't want the brake to engage with the throttle on! If it isn't done correctly, the engine heats up the brake, which taxes the motor and wears out your brake prematurely.

The gear mesh is also critical for good performance. If it's too loose, the gears wear out quickly and are easily damaged; if it's too tight, the gears cause excessive drag,

which wears out the gears and the clutch prematurely and slows down the truck. After the engine has been installed, you can adjust and tighten the gear unit.

I decided to use the Futaba* Magnum Junior radio system and the high-torque SP131 steering servo. The best place to mount the steering servo is below the servo tray, because you won't have to make many bends in the steering rod for it to reach the steering assembly.

I chose a 5-cell Sanyo* 1000mAh Ni-Cd for my receiver pack. First, I wanted to ensure that I didn't lose control of the vehicle. Second, the high voltage of this pack makes the steering quicker



"This vehicle is at home among stumps, drains, hills and ravines! Nothing perplexed this polycarbonate-covered civilian tank..."

and more responsive. You can use a switch for the battery, although switches can fail when they're exposed to vibration, fuel and dirt, or you can simply plug the pack into the receiver.

The engine preparation and installation is nicely diagrammed and fairly easy to follow. My Nitro Crusher is powered by an O.S.* Max .21 SE-B ABC buggy engine. This fit perfectly on the supplied engine mount with no modifications. If you plan to use an Enya engine, you'll have to modify the mounting holes. If the engine mount isn't aligned properly with the chassis, the gears won't mesh properly.

The throttle linkage is tricky because it not only controls the carburetor but it's also connected to the brake rod. With a little tinkering (and some help from Steve Pond) I was able to set the linkage correctly. The carburetor should have a full range of motion, and the brake should just start to engage when the engine is at idle.

The rubber wheels fit snugly on the chrome rims. The tires, which expand considerably under the immense torque, are under constant pressure and abuse during operation. You must glue the tires to the rims with a coat of CA. Be sure to lift the tire and spread the glue evenly onto the rim before you position the tire on it.

The body is a standard polycarbonate shell. Unfortunately, Kyosho didn't provide

KYOSHO USA-1 NITRO CRUSHER

Type Monster truck
Scale 1/10
Price \$479.95

DIMENSIONS:

Overall Length 18.175 inches
Width 16.5 inches
Wheelbase 12.375 inches
Front Track 12 inches
Rear Track 12.125 inches

WEIGHT:

Gross (with battery) 9 pounds, 3.41 ounces

BODY:

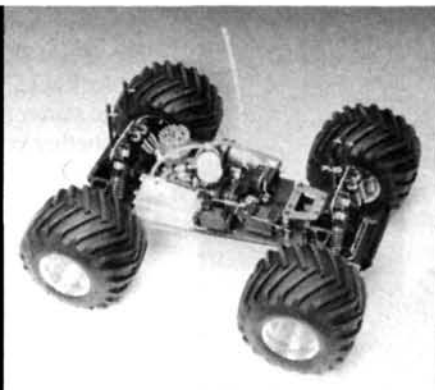
Type USA-1 pickup
Material Polycarbonate

CHASSIS:

Type Plate
Material Aluminum

Options as Tested: Kyosho quick-fill tank; O.S. .21 buggy motor; Futaba Magnum Jr. radio; S132H and S131S servos; five 1000mAh cells.

Comments: The Nitro USA-1 isn't a built-up version of the electric truck. It's based on the 1/8-scale Kyosho Burns car, so it's extremely rugged and can withstand the harshest terrain. Assembly is straightforward, and the kit includes everything except radio gear and an engine.



DRIVE TRAIN:

Primary Pinion/spur
Transmission Shaft-driven 4WD
Differential Bevel gear
Bearings/Bushings Bushings

SUSPENSION:

Type (t/r) Single A-arm w/upper link
Damping (f/r) Oil-filled, coil-over shocks

WHEELS:

Type (t/r) One-piece molded
Dimensions (DxW) (t/r) 2.875x4 inches

TIRES:

Front/Rear Paddle tread

USA-1 NITRO CRUSHER

dimples to indicate where the holes should be drilled, so it's up to you to measure the post marks. Before I painted the body, I placed it on the body posts and marked the drill holes.

The realistic decals provide the scale touch. Before you position the larger decals, apply soapy water to the body so that you can easily adjust the decals. Once you have a decal

in position, squeeze out the excess water and blot it with a paper towel. The lower dirt guards also look good, and they help to deflect dirt and water.

PREPARATION AND STARTING

To run the Nitro Crusher, a field box comes in handy. You can buy a field box made for R/C cars, or you can de-

sign and build your own. It should contain a 12V motor-cycle battery, a power panel, a high-torque starter, fuel, a fuel bulb and a glow-plug igniter. A fuel pump, extra glow plugs and a glow-plug wrench might also be helpful.

Consult the engine manual for proper break-in and adjustment methods. You can break-in most R/C engines by running the first few tanks of fuel rich and making the mixture leaner with each successive tank.

First, fill the tank with fuel. You can use a synthetic castor blend, but a true castor blend is ideal. Open the main needle valve $2\frac{1}{2}$ to 3 turns. Attach a glow-plug clip or Ni-starter to the glow plug in the engine. Make sure the starter is rotating in the right direction before you use it. The motor should spin counterclockwise, but the direction of the starter rotation depends on whether you're starting the vehicle from behind or from the front.

RUNNING

When I assembled the truck, I accidentally reversed the muffler and carburetor fuel lines. As a result, I almost burned out my starter when I tried to start the truck. The engine kicked over, but it wasn't getting enough fuel, and it wouldn't start. After eagle-eyed gas-guru John Huber spotted this nitro faux pas, I was back in business.

The engine fired up easily. The truck ran strongly, and it made it through the photo shoot; the clutch suddenly locked up and the engine siezed. Fearing the worst, I disassembled the clutch and found that the pilot shaft had come loose. You really have to tighten this sucker down! Again, use high-temp thread-lock on the shaft.

After some parking-lot antics around the Air Age building, I decided to let the truck cut loose on a hilly lot close to my home. With all parts tightened securely, I fired up the Nitro Crusher and started to menace my surroundings. The crackle of the glow-plug ignitor and the smell of burning gas brought back memories of my Cox .049.

This truck is at home among stumps, drains, hills and ravines! Nothing perplexed this polycarbonate-covered civilian tank and I soon began jumping whatever mountainous terrain I could find. The truck was nicely balanced, and it usually landed on the rear wheels. Avoid fast front-end collisions, though. The front tie rods don't have ball connectors; they're screwed into the connecting arms, and as a result, they snap. Be careful! After I had used nearly a quart of nitro and petrified the squirrel population, I called it a day.

Assembling and running a gas-powered R/C vehicle is a rewarding, challenging experience. Of course, operating a gas engine requires a responsible, safety-conscious driver. Whether you're new to gas-powered vehicles or a veteran driver, you'll have a field day assembling, tuning and running the mighty Kyosho Nitro Crusher.

**Here are the addresses of the companies that are mentioned in this article:*

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

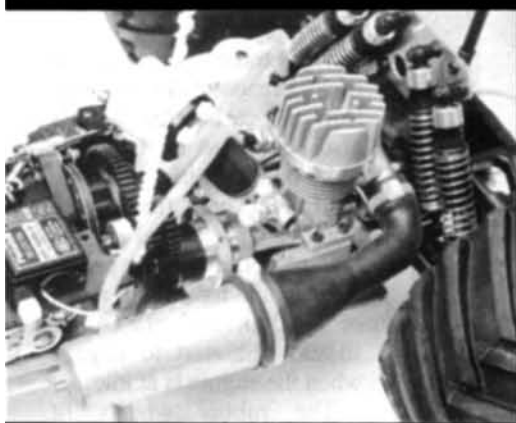
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Sanyo Energy Corp., 200 Riser Rd., Little Ferry, NJ 07643.

O.S.; distributed by Great Planes Model Distributors. ■



The Nitro USA-1 relies on four oil-filled Kelron shocks up front, and another four in the back. These shocks work well and they add scale appearance.



The only things you'll need to complete the Nitro USA-1 are an engine and radio gear.



As on the Burns off-road car, a shaft-driven 4WD system powers all four wheels on the USA-1. The disk brake and the throttle are actuated by a Futaba S132H servo.

HOME-BUILT PROJECT:



b y J O H N H U B E R

THIS MONTH'S home-built project comes from Al Walck of New Jersey. What started as a used Big Boys Toys® RC10 sprint-car conversion turned

into an elaborate, gas-powered sprint car complete with a pulling vehicle, a trailer and accessories. Al is a real sprint-car fan, and he wanted every detail to shine with perfection.



PHOTOS BY JOHN HUBER

GEAR IT UP

First, Al wanted to turn his RC10 into a gas-powered vehicle. In order to make the conversion, he had to come up with a complete drive system. He mounted a

Nitro Sprinter





Above, left to right:
 ■ When Al Walick constructed his scratch-built sprint car and trailer, he paid attention to every detail, including miniature rollaway toolboxes and a scale jack. ■ Al made the toolboxes out of .032-inch-thick aluminum, and Matchbox car wheels simulate full-size casters. The side walls of the trailer hold spare parts. ■ With the side wall swung open, the scratch-built jack and the toolboxes can be neatly slowed away.

Kyosho* Assault gearbox on the chassis. Al wanted a mid-mounted motor for his sprinter, and this meant that if the gearbox were driven directly from the engine, the wheels would rotate in the wrong direction. By cutting the teeth off a 14-tooth clutch bell and mounting it on a bolt, he was able to fashion a counter gear, but he had to move the engine slightly to the right of the chassis center line. Al also had to remove some of the chassis to mount the gearbox properly.

Clearance was also needed for the flywheel and a pull-starter, but after trying the pull-starter a few times, Al decided

Al used a Tatone* twin header and flexible silicone tubing to route the exhaust out through the bottom of the chassis. A 1/8-inch spacer allows the header to clear the cylinder head. Two tubes run from underneath the chassis into the brass headers on the sides of the car. Al tried running the car with the exhaust exiting the headers, but oil sprayed on all the rear suspension components, so he extended the exhaust to the rear. Inside the rear cowl is a 2-ounce fuel tank. Most of the new sprint cars have a high hood that conceals the engine and air cleaner, but Al prefers the older style. He made the air cleaners out of some screen material and sheet metal.

PULLING PACKAGE

To make this project even more impressive, Al decided to make a matching trailer and truck. He used a Tamiya* Wild One chassis and a Parma* Bronco body for the pulling vehicle. He had to move the front end forward about 1/2 inch so that the Bru-Line* wheels would line up with the fenders. The mirrors and fenders are made out of sheet aluminum.

Then it was time to build a trailer. Al decided to make it out of .032-inch-thick aluminum because it's rigid and easy to work with. Other than tin snips, no other special tools were required; and the entire structure is held together with

2-56 nuts and screws. The trailer's frame is made of 1/4x 3/8-inch hardwood, and its axles are 3/8-inch-diameter dowels. To make the trailer fenders, Al formed pieces of aluminum sheet around a small jar, epoxied the fenders to aluminum plates, polished them and screwed them to the frame.

The toolboxes were also made out of .032-inch-thick aluminum. The handles are small T-pins, the wheels are from a Matchbox car, and the black top is sandpaper. A jack, gears, and extra parts are stored in the area below the wheels; a fire extinguisher made of a CO₂ cartridge is mounted on the front of the trailer.

Nice job, Al! Our readers' originality and resourcefulness continually amaze us. Just when we think we've seen it all, you guys come up with something that blows us away. Keep 'em coming!

**Here are the addresses of the companies mentioned in this article:*
Big Boys Toys, 4408 Moscato Way, Bakersfield, CA 93306.
Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.
Tatone, 21658 Cloud Way, Hayward, CA 94545.
MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.
Parma International, 13927 Progress Pkwy., North Royalton, OH 44133.
Bru-Line Industries, P.O. Box 3786, Center Line, MI 48015. ■



Above: To emulate a full-size race-car trailer, Al's scratch-built, 1/16-scale version has a rack mounted on its front section to hold spare tires, parts and other miscellaneous support equipment.

that it was easier to start the engine with the flywheel, so he removed the pull-starter. The inside of the compartment was so cramped that the only place left for the servo was above the engine. (He attached it to the wing's underside with a bracket.)

GASOLINE ALLEY

by MIKE BILLINTON

Nova Rossi Rex 7/SCT

IN COMPETITION CLASSES, it's often obvious that one engine is more popular than others. In the international 1/8-scale open class, the engine of choice seems to be Nova Rossi's Rex 3.5cc.

Earlier Nova Rossi engines, e.g., the Blackhead and the Red-head of the mid '80s, were excellent performers compared with many on the market. With the bit very firmly between his teeth, guiding light Cesare Rossi continues to produce his fabulous car engines. They perform so well that you rarely find other makes on the entry lists and results sheets at 1/8-scale events.

Because of this, my initial feelings about testing the Rex were mixed. Was its popularity a fashion "thing," or did it really offer superior performance?

When I first examined the test engine, I immediately noticed its superb construction and its unusual design features. It's a car 7/SCT—the top competition version—and Rossi claims it can produce 2.2hp at 31,500rpm. Its basic layout consists of the proven one-piece crankcase with front induction and a Schnuerle/ABC piston/liner. Its moderate exhaust timing will provide a wide-band performance on a tuned pipe. Its unusual features include:

- a unique cylinder liner that has extra transfer-port area in the form of slots;
- an exhaust port with a raised point in its center that provides 170 degrees of timing compared with the 164-degree average provided by most of the port;
- a Turbo crankshaft with three milled grooves that reduce gas-flow restrictions and possibly assist fuel mixing in the lower crankcase;
- a connecting rod that's profiled and finely machined out of solid aluminum alloy. Its big, "bushied" end is thick enough to ensure that it won't fail at high rpm.
- a Turbo glow plug that's available in eight versions (hot to cold). Rossi recommends the best ambient temperatures, nitro content and squish clearances for each one. With this engine, there's no excuse for incorrect running and burnt-out plugs, etc.

The tip on a normal glow plug is more isolated from the cylinder head's cooling properties than the tip on this one. A glow plug is usually exposed at the center of the combustion process,

and its steel body provides poor heat conductivity, so it's not surprising that it fails and overheats. The other problems caused by this poor conductivity, i.e., runaways and over-advancing of the ignition point, negatively affect the engine's performance.

The plugs used on the Rex help you to avoid such problems. They sit firmly against the tapers at the bottom of the threads, so they're positioned right against the combustion chamber. Because of this, heat is rapidly transferred from their tips to rest of the cylinder head. (This prolongs the life of the glow plug. I only had to use one for the main part of my test!)

The large, purple-anodized, heat-sink head, the finned exhaust manifold and the new glow plug enable this engine to run very coolly—even with a tuned pipe and 50-percent-nitro fuel. This makes the engine more reliable. It also allows consistent fuel settings, which are usually subject to change when an engine's temperature varies greatly.

The carburetor fuel controls have O-rings that prevent them from moving after they've been set. Even when the engine vibrated briefly just before it reached 30,000rpm, these controls remained rock-steady and tight. It's rare for an engine to go through the whole rpm range in my tests without having a part that needs to be tightened, so the Rex is unusually solid.

With a bore of almost 9mm, the carburetor is large enough for high rpm. The aluminum slide barrel is hard-anodized to prevent wear.

The Rex's virtually equal stroke/bore ratio of 1.0008:1 contradicts the idea that high-rpm, 2-stroke engines need short strokes. In fact, when the stroke and the bore are equal, the maximum porting areas can still be obtained.

Even more important is the reduced reciprocating (piston and cylinder) weight and, here, the light piston (.1 ounce) must be

The Rex 3.5cc has considerable heat-sink and cylinder-lin cooling capacity and this, together with Turbo plug, results in very cool running.

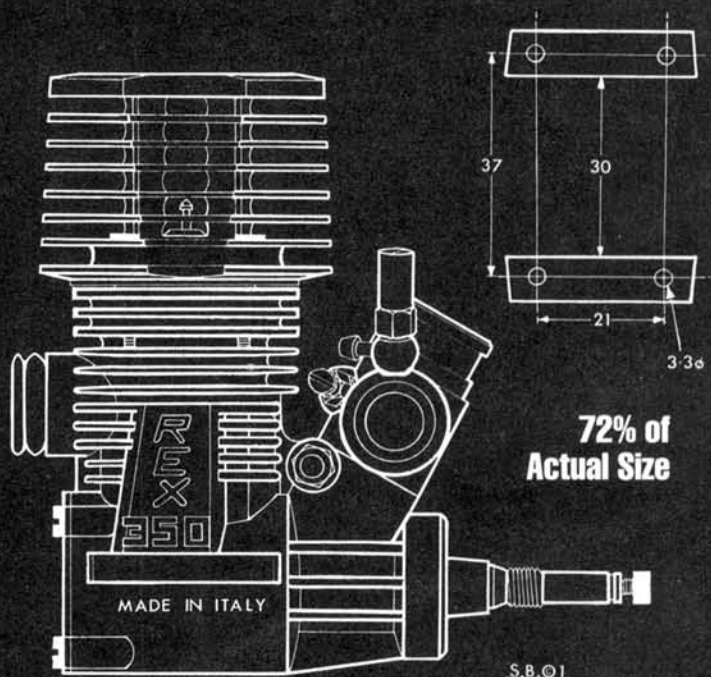


PHOTOS BY MIKE BILLINTON

SPECIFICATIONS • NOVA ROSSI REX 7/SCT

WEIGHTS & DIMENSIONS

Capacity	0.2119ci (3.472cc)
Bore	0.646 in. (16.40mm)
Stroke	0.6465 in. (16.42mm)
Stroke/bore ratio	0 1.0008:1
Timing Periods	Exhaust—170 degrees
	Transfer—120 degrees
	(angled up 20 degrees)
	Boost—118 degrees
	(angled up 40 degrees)
	Front Induction:
	—Opens—37 degrees ABDC
	—Closes—55 degrees ATDC
	—Total Period—198 degrees
	—Blow-down—25 degrees
Combustion volume	0.36cc
Compression ratios	Geometric—10.64:1
	Effective—7.11:1
Exhaust-port height	0.237 in. (6.04mm)
Cylinder-head squish	0.011 in. (.28mm)
Cylinder-head squish angle	5 degrees
Squish-band width	0.14 in. (3.6mm)
Carburetor bore	0.351 in. (8.93mm)
Crankshaft diameter	0.511 in. (13mm)
Crankshaft bore	0.366 in. (9.3mm)
Crankpin diameter	0.186 in. (4.73mm)
Crankshaft nose thread	0.250 in x 28 TPI (1/4 UNF)
Wristpin diameter	0.157 in. (4mm)
Connecting-rod centers	1.18 in. (30mm)
Engine Height	3.95 in. (100.43mm)
Width	1.77 in. (45.1mm) across lugs
Length	2.48 in. (63.1mm) front bearing
	to rear cover
Width between bearers	1.2 in. (30.5mm)
Mounting-hole dimensions	21x37.5mm (3 holes)
Weight	10.95 oz. (310g)
Crankshaft weight	1.35 oz. (39g)
Piston weight	0.10 oz. (3g)



PERFORMANCE:

Max. b.hp	1.48 @ 27,852rpm (open exhaust/5% nitro)
	1.68 @ 28,870rpm (tuned pipe @ 295mm/25% nitro)
	1.99 @ 31,100rpm (tuned pipe @ 275mm/50% nitro)
Max. torque	58 oz./in. @ 19,725rpm (open exhaust/5% nitro.)
	59 oz./in. @ 27,746rpm (295mm tuned pipe/25% nitro)
	64 oz./in. @ 31,100rpm (275mm tuned pipe/50% nitro)

significant. It gives easy, vibration-free running up to the maximum rpm.

PERFORMANCE

My theory that "fashion" was responsible for the popularity of the Rex 3.5cc engine received a fatal jolt! My early rpm tests (open exhaust) showed that Cesare Rossi has created a stormin' engine! These tests also showed that this engine's open-exhaust performance might equal a rival engine's tuned-pipe performance.

Test 1. Open Exhaust. Fuel: 5 percent nitro/15 percent castor oil/80 percent methanol. Plug: medium/cold Turbo.

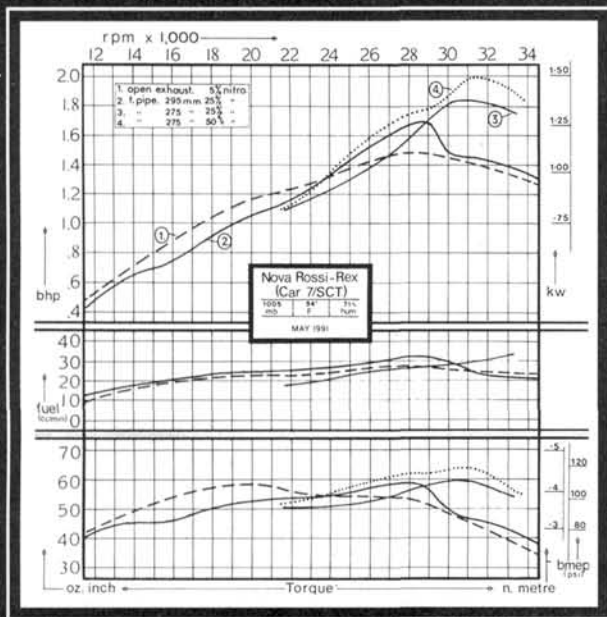
Nova Rossi advises against the use of synthetic oil. There are some inferior or unsuitable types, so it's probably safer to recommend only castor. The arguments about this continue: some



Note the extra transfers that are squeezed between the exhaust and boost ports. The Turbo shaft actually provides a method of opening the mouth of the induction throat for better "breathing." The well-made connecting rod is streamlined.

competitors use 5 percent of a "good" synthetic oil; others have a "no less than 20 percent castor" rule. Although my experiences have been in controlled situations, I've found synthetic oil's performance to be satisfactory, even when I've pushed the engine to its limits.

The initial torque figures in this test confirmed the engine's exceptional rpm. The maximum torque of 58 ounce/inches is as



RPM ON STANDARD FIXED-WING PROPELLERS:

	Open Exhaust/ 5% nitro	295mm Tuned Pipe/ 25% nitro
7x6 Taipan	19,617	19,986
7x4	25,600	27,800

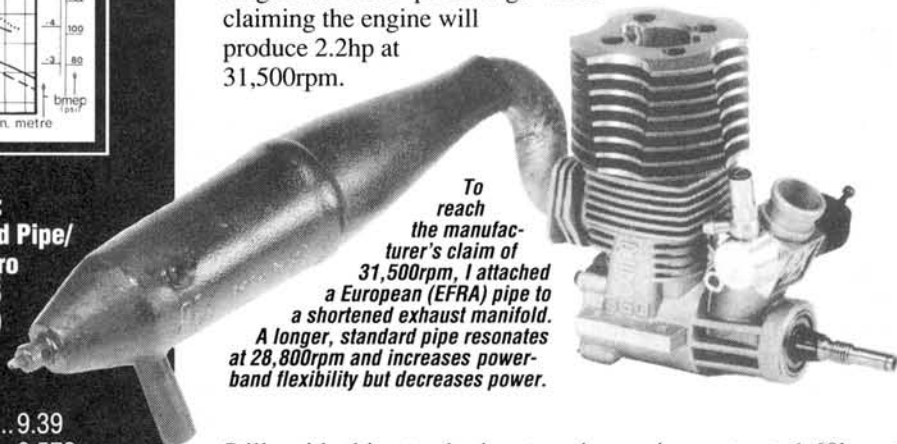
PERFORMANCE EQUIVALENTS:

b.hp/ci	9.39
b.hp/cc	0.573
Oz. in./ci	302
Oz. in./cc	18.4
Oz. in./lb	93.5
Gram meter/cc	13.7
b.hp/lb	2.91
b.hp/kilo	6.42

Manufacturer: Cesare Rossi & Co., Rodengo Saiano, Italy
U.S. Distributor: Rossi USA, 214 Harvest Ave., Staten Island, NY 10310.

lowed them to overlap by approximately $\frac{1}{2}$ inch. I sealed the overlap with a piece of silicone tubing.

To achieve the torque and horsepower levels claimed by the engine manufacturers, you have to push the engine close to its limits of reliability, and this isn't good for consistent, day-to-day performance. That's why Rossi doesn't specify the precise pipe length and nitro percentage when claiming the engine will produce 2.2hp at 31,500rpm.



Still, with this standard setup, the engine put out 1.68hp at 28,870rpm. To reach the 31,500rpm max claimed by the company, I knew I'd have to shorten the pipe, so that's what I did.

Test 3. Rex pipe shortened to 275mm. Fuel/plug as in Test 2.

Two centimeters was the most I could remove from the convoluted exhaust manifold. With the shorter pipe, the engine reached 31,000rpm and 1.84hp. The tradeoff of less torque at low rpm still had to be made, however.

Test 4. Pipe still at 275mm. Fuel: 50 percent nitro. Plug now cold/cold.

I think the manufacturer's claim of 2.2hp is the highest claim in the world for a commercial 3.5cc model car engine. I switched to 50-percent-nitro fuel to see if the figure was realistic. I couldn't get the correct .4mm squish clearance on the day of the test, and I had to settle for a tight .3mm clearance, so I was a little worried. For the sake of the engine's survival, my readings were more like "spot readings," because I didn't want to run the engine for too long on 50-percent-nitro fuel. How did the Rex 3.5cc do? Is Rossi's claim of 2.2hp baloney? The Rex produced the highest figures of my test series—1.99hp (let's call it 2hp!). With a more suitable plug and the recommended squish clearance, that level could probably be reached.

To produce these readings, torque had to be above 60 ounce/inches well past 30,000rpm. Only a well-designed engine with a suitable tuned pipe can do this.

SUMMARY

My final test figures support the Rex's outstanding reputation. This extremely reliable engine will perform solidly without straining. It's probably the standard-setter at present.

Apart from adjusting squish clearance and nitro content to suit the temperature, you won't have to do much to the Rex at the track to "tune" it. But they still keep looking for ways to improve it.

high as some readings I've achieved with tuned-pipe engines running with high-nitro fuels. More than 1.2hp is available over rpm that range from 21,000 to 35,000. This confirms the very wide-ranging performance of modern high-performance 2-strokes. The final maximum of 1.48hp at 27,852rpm is the highest open-exhaust figure I've achieved in this series of 3.5cc car-engine tests.

Test 2. Rex/EFRA 295mm tuned pipe (measured from the plug to the end of the pipe). Fuel: 25 percent nitro/10 percent castor/65 percent methanol. Plug as in Test 1.

Rossi says you shouldn't use a fuel with more than 30 percent nitro, and 25-percent-nitro fuels are most common at the track, so I tested the Rex 3.5cc with that. (Fuels with more nitro than that can shorten plug life and reduce reliability—and they're more expensive, too!) I used the manufacturer's tuned pipe and exhaust manifold in their out-of-the-box, uncut lengths and al-

NITRO NEWS

by JEFF BRONSTEIN

Breaking & Entering

DON'T WORRY about alarms; this break-in won't be a felony offense. But you *will* steal a few more wins if you read this edition of "Nitro News"!

Breaking-in a new engine is a well-proven and widely accepted way to improve its performance. It's also an important final step toward preparing the engine for competition. If you reduce the inherent drag of an engine's internal parts, it will be able to use more of its power to turn the tires. This will mean more punch for your buck!

THE REASONS WHY...

Two-stroke engines have few moving parts, but the tolerances necessary for high performance, particularly between the piston and the liner, are very precise. The friction fit between the mating surfaces prevents high-pressure gases from escaping during the combustion process.

Even the most carefully machined parts in a 2-stroke engine have slight imperfections that cause friction. This friction can rob a new engine of power, and it creates heat that can cause the parts to expand and create even more friction and heat. If it's not cared for properly, an engine can become a paperweight before it ever reaches the track.

When you break-in an engine, the small irregularities are "burnished off," leaving a perfect fit between the contact surfaces. At the same time, you're "heat treating" the internal parts so that they'll expand to the proper size. Although there are short cuts, the method outlined here is the most widely accepted way to properly break-in high-performance engines. Your engines will run cooler, last longer and produce significantly more power if you follow these procedures.

BREAKIN' AND ENTERIN'

To break-in a new engine, you must run it "rich"—a condition that will provide it with surplus fuel and lubricants. Most en-

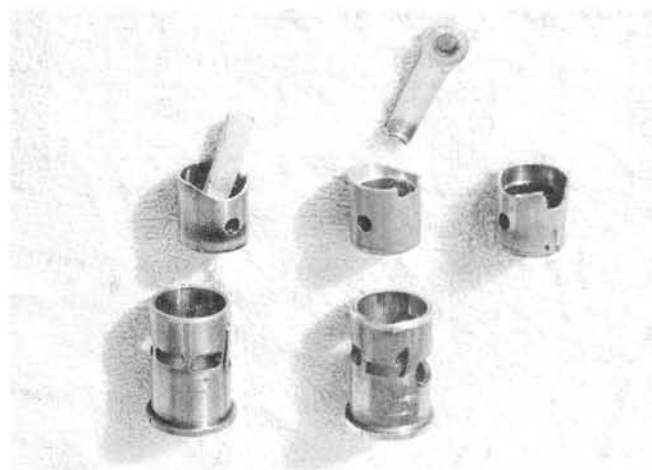
gine specialists agree that it's important to get the engine up to operating temperature first so that its internal parts will expand properly. The extra lubrication will act as a buffer while the various surfaces slowly polish one another to an ultra-smooth finish. Unused fuel also carries away the heat and the extremely fine fragments of metal generated during the process. It may take several tanks of fuel to thoroughly break-in the engine, but the results will be worth it.

In addition to the proper needle-valve settings, it's important to use low-nitro fuel—10 to 15 percent maximum. A fuel with a higher nitro content will cause additional heat, and this will lean the carburetor settings.

Set the carburetor according to the manufacturer's recommendations, and then open the high-end needle valve one full turn. (If the instructions outline a break-in process for your engine, use the setting that's indicated.)

New engines can be difficult to start, especially modified engines. One trick is to remove the glow plug, put several drops of after-run oil in the cylinder, and then turn the engine over for a few seconds. Replace the glow plug, but don't tighten it completely so that some of the compression can escape. When the engine begins to idle consistently, tighten the plug. If it dies because of an overly rich setting, close the valve about one-fifth turn, and start again.

The all-important starting period, i.e., when the engine begins to heat up, re-



Here's what happens when a new engine fails owing to excessive heat and friction. If the racer had taken his time during break-in, this could have been avoided.



At first, loosen the glow plug to reduce some compression. This will make it easier to turn the engine over during the first few seconds.

quires careful attention. The internal parts must reach the proper operating temperature fairly quickly, but they should *not* exceed it at any time! At first, the engine

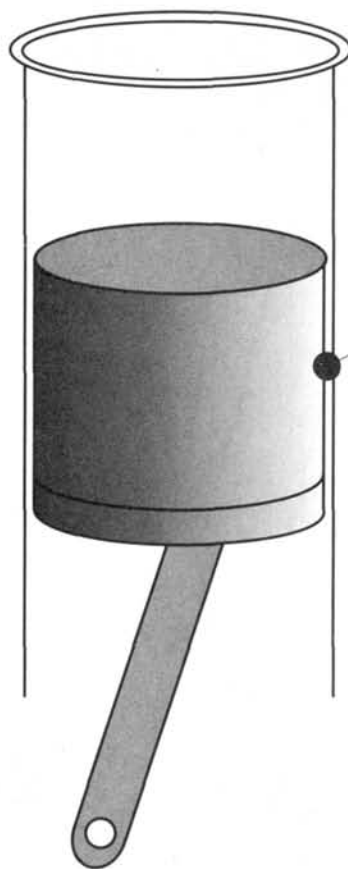
(Continued on page 46)

NITRO NEWS

should sound rough, but not too rich. Adjust the needle valve to keep the engine running in the 2-stroke range. The setting should also be rich enough not to come completely clean at full throttle. Temperature is the most important factor and should be re-emphasized: if it's too rich, the engine won't heat-treat the internal parts; if it's too lean, the parts may wear excessively.

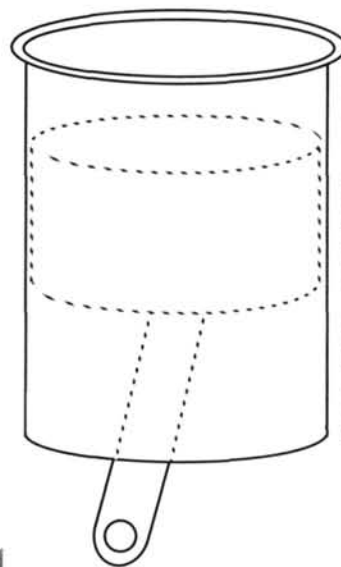
BREAK-IN ACTION

Get to the track as soon as possible, and run the car. Don't break-in the engine under no-load conditions, i.e., with the car's wheels off the ground. Don't let the car sit and overheat; keep it moving to ensure a steady airflow over the heat sink. Vary the speed, and avoid using full throttle for more than a few seconds. Run the car for several laps at a time, and



During the burnishing process, slight irregularities are polished off so that the piston and the sleeve fit together perfectly. The extra oil and fuel create a buffer and carry off the excess heat that develops during break-in.

Additional fuel (oil and methane) provide a buffer and carry away small particles of metal produced by the process.



Heat makes the fit between the piston and the liner even tighter.

As a new piston and liner heat up for the first time, the metal expands in a process called "heat treating." Once these parts have expanded, they'll never contract back to their original size.



Putting few drops of after-run oil or Marvel Mystery Oil into the glow-plug hole of a new engine will enable the piston to move when its piston/cylinder fit is still very snug.

check the engine temperature regularly. Try not to run the fuel tank completely dry, because this will lean the engine briefly before it stalls. Before the second tank of fuel, let the engine cool down to the ambient temperature. As the internal parts cool, they'll contract slightly, but they won't return to their original size.

During the second tank, lean the engine slightly, but keep the fuel setting rich. Continue to vary the speed and check the engine's temperature. As the mating parts begin to burnish one another to fit, the engine's temperature will drop slightly, and its performance will increase. For the best results, keep the set-

tings rich through at least two or three more tanks of fuel. Follow each by a cool-down period. At this point, you can start to tune for race conditions.

The piston ring in a full-size engine forms a proper seal between the piston and the cylinder wall. Most 2-stroke R/C auto engines, however, use an ABC (aluminum, brass, chrome) design instead of piston rings. A tight "contact" band around the piston works in the same way as a piston ring. A new engine's contact band is roughly 1/2 inch wide. As it wears, it creates less friction on the piston, and the engine becomes stronger and more efficient. Although they may last as long as a year, eventually, the piston and cylinder liner will need to be replaced (nothing lasts forever), and you'll have to break-in the new set.

A well-maintained, older engine might have more punch than a new one! Remember, you don't need a lawyer after your first break-in. ■

TRACK REPORT

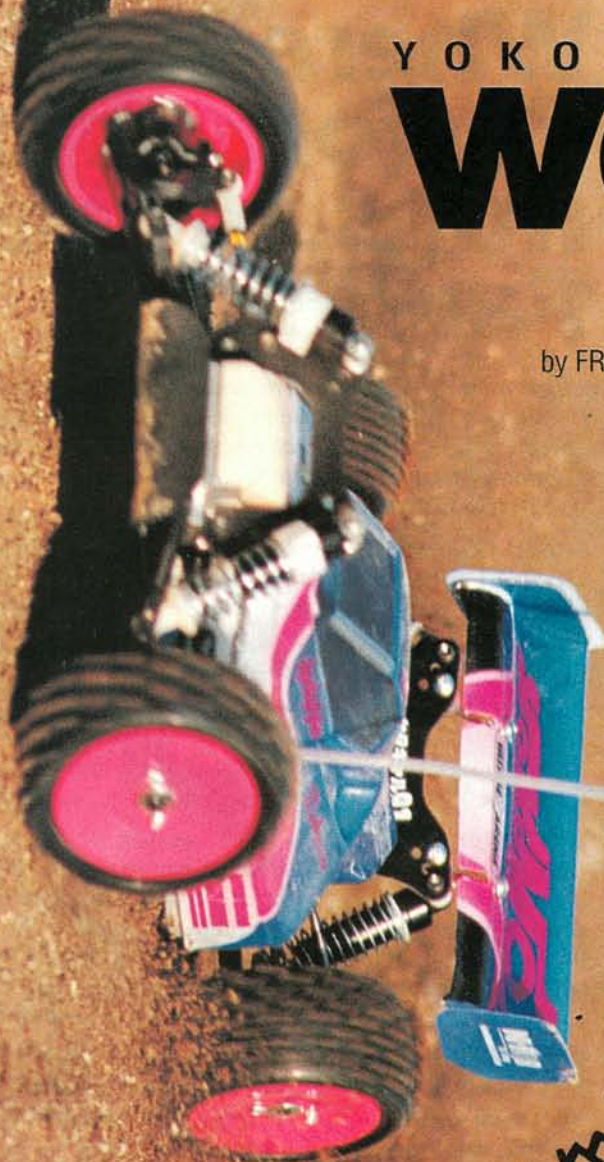


PHOTOS BY JOHN-CLAUDE VAN DAMMANT

YOKOMO

WORKS '91

by FRANK MASI



Grand-slammin' samurai

DID YOU KNOW that, in Japan, the most popular class of R/C racing is 4WD off-road? It's true: 4WD cars outnumber 2WD entrants at just about every off-road event.

Four-wheel drive off-road cars are far more sophisticated than other electric R/C cars, and they're capable of out-accelerating and out-handling their 2WD counterparts. In the U.S., however, 2WD cars are far more popular than the 4WDs. Why is this? Probably because American manufacturers focus a great deal of their attention on 2WD, so parts are inexpensive and readily available.

Of all the manufacturers of 4WD cars, one company stands out in my mind as a technological innovator—Yokomo*. This Tokyo-based Japanese company revolutionized off-road racing in 1984 with the release of the 4WD Dogfighter, which quickly proved that having four driven wheels was the fastest way around a track. With Gil Losi Jr. at the controls, the Dogfighter won the first-ever IFMAR Off-Road World Championships in 1985. Sanctioning bodies were eventually forced to create a 4WD class because of the performance advantages of 4WD.

SPECIFICATIONS

Type 4WD Off-road
 Scale 1/10
 Sug. Retail Price N/A

DIMENSIONS:

Overall Length 14 inches
 (not including wing)
 Width 9.5 inches
 Wheelbase 10.875 inches
 Front Track 8.062 inches
 Rear Track 8 inches

WEIGHT:

Gross (with battery) 3 pounds, 9.92 ounces

BODY:

Type Single seat
 Material Polycarbonate

CHASSIS:

Type Rigid plate with
 upper brace
 Material Graphite

DRIVE TRAIN:

Primary Pinion/spur
 Transmission Belt drive
 Differential Ball (f/r)
 Bearings/Bushings Sealed ball bearings

SUSPENSION:

Type(f/r) Single A-arm with upper
 camber link
 Damping(f/r) Oil-filled, coil-over shocks

WHEELS:

Front: Type One-piece molded
 Dimensions
 (DxW) 2.150x1.125 inches
 Rear: Type One-piece molded
 Dimensions
 (DxW) 2.150x1.375 inches

TIRES:

Front Hot Laps step pin TF-340
 Rear Hot Laps TR-380

ELECTRICS:

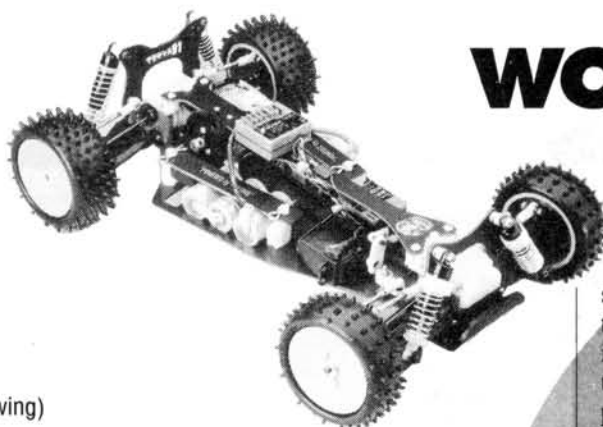
Motor, Battery, Speed Controller not included

OPTIONS AS TESTED:

Airtronics Caliber 3P, Novak NER-3FM receiver, Novak 410-M1c electronic speed controller, Sanyo 6-cell 1700mAh SCE batteries, KO-Propo PS 1001 FET super-servo, Yokomo Super Wing series 14-turn double modified motor.

COMMENTS:

This is Yokomo's most serious (and expensive) race kit. Racers need not purchase any aftermarket parts; it's truly an out-of-the-box winner. Although Associated doesn't plan to import this car, my guess is that another company may do so.



The Dogfighter underwent many refinements until, in 1987, it was replaced by a completely new model, the Super Dog Fighter (YZ-10 in the U.S.), which enjoyed the same racing success as its predecessor: Masami Hirosaka won the '89 World Championship with one. Like the original Dogfighter, the Super Dog Fighter has undergone many modifications, and the result is the car that graces these pages—the Works '91 4WD racer.

DOG-FIGHTING FEATURES

The Works '91 is the result of Yokomo's extensive R&D, and it features many parts previously offered only as options.

• **Chassis**—The most noticeable difference between the Super Dog Fighter and the Works '91 is the chas-

sis. The batteries are much closer to the center of the car, thereby narrowing its roll-center. This allows the car to react more quickly to steering input, and it decreases chassis roll during cornering.

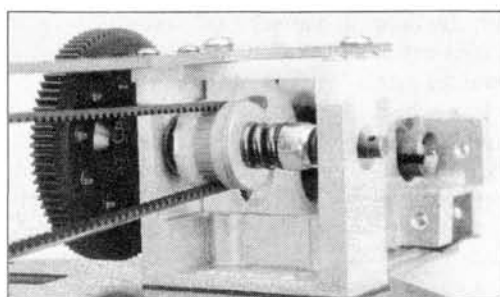
The Works '91 chassis is graphite—not the black fiberglass of which its predecessor's chassis was made—and an upper chassis stiffener replaces the previous car's graphite backbone.

• **Drive train**—The Works '91 features two drive-train components previously offered only as options: a universal spur-gear adapter with dual one-way bearings and fine-pitch drive belts with matching pulleys.

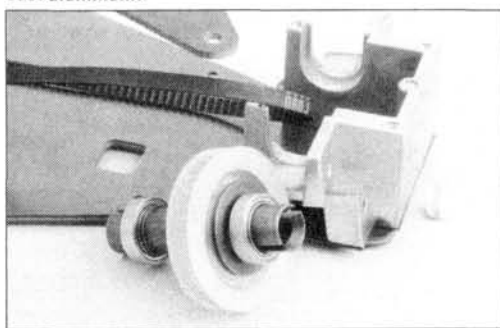
The spur-gear adapter allows you to use most spur gears, and its dual one-way bearings provide smooth operation with less shaft wear. The fine-pitch belts decrease friction in the drive train and thus reduce power-robbing drag. They're slightly more fragile than the belts used on the Dog Fighter, so, to avoid stripping them, it's generally recommended that you run the Works '91 with no more than six cells.

As with Super Dog Fighters, the Works '91 has smooth-operating ball differentials in both the front and the rear, and the center drive shaft incorporates a slipper unit that limits the drive to the front wheels.

• **Bulkheads**—The Super Dog Fighter's cast-magnesium bulkheads were a big problem. Magnesium is very light and rigid, but it's somewhat brittle, and many owners found that the bulkheads broke easily. To remedy this, Yokomo now makes the bulkheads of cast aluminum, which isn't as light as magnesium, but is substantially more durable.



The heart of the Works '91 is its fine-pitch belt-drive system. Power from the motor is transmitted to front and rear ball diffs through a center shaft (above). The ball diffs are easily accessible; just remove the retaining covers (below). The Works '91's bulkheads are made of durable cast aluminum.



WORKS '91

The Works '91 chassis also has slotted holes in which you mount the bulkheads; this allows you to adjust the belt tension by sliding the bulkheads.

● **Suspension Arms**—Reducing wheel scrub is of great importance. Wheel scrub occurs when the car's track width (the distance between the center line of each set of wheels) changes during the suspension arms' range of travel, causing un-

● **Shocks**—If you've ever built a YZ-10 for competition, the first items you probably replaced were the kit's shocks, which simply weren't up to the rigors of racing. The Works '91, however, includes a full set of top-quality, large-volume shocks that have black-anodized, Teflon-coated bodies. These shocks have dual O-ring seals that are inserted from the bottom of the shock body and retained with a C-clip. Also, their Teflon pistons provide silky-smooth damping action.

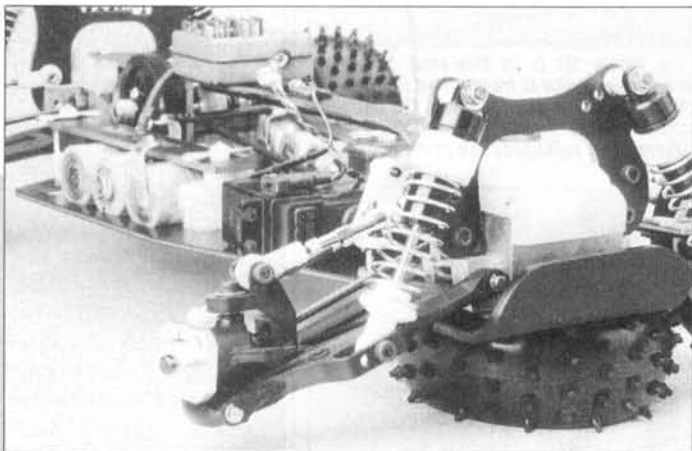
Included in the kit is Yokomo's spring-adjustment system. Instead of sliding a clamping spring collar along the shock body to adjust ride height, Yokomo provides a variety of molded spacers that you can insert between the spring collar and the top of the shock body. You can remove them with the handy tool included in the kit.

To keep the shocks in the proper geometry with the longer A-arms, the

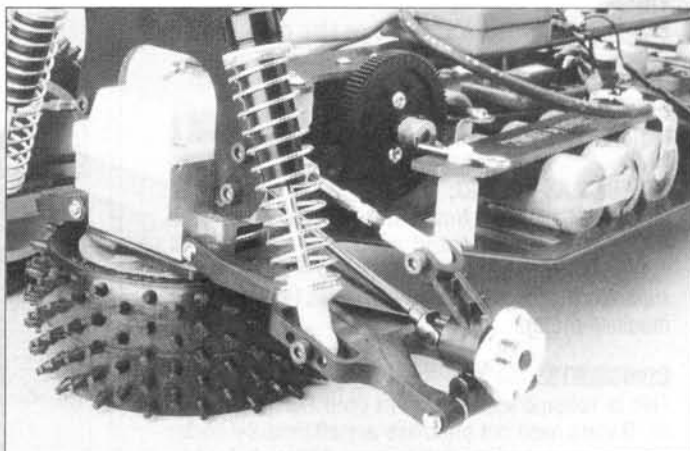


Novak's most recent version of the 410-M1c features a "solder-pop" fuse. Instead of buying replacement fuses after a short, you can simply remove the fuse cover and bridge the fuse connection with molten solder to complete the circuit. Novak has also redesigned its current-limiter adjustment potentiometer. Simply rotate the "metered" knob—no tools required!

wanted lateral (side to side) movement of the tire over the track surface. To limit wheel scrub, the Works '91 uses extra-long A-arms in both the front and the rear. The longer the A-arm, the less wheel scrub. The rear arms are molded to produce about 3 degrees of toe-in; this stabilizes the rear of the car during acceleration and braking.



The Works '91's front suspension has extra-long A-arms and specially designed wheel hubs that widen the car's track to the legal maximum. Long universal-joint drive shafts and titanium turnbuckles are standard equipment.



The rear suspension also has extra-long A-arms. The Works '91 differs from previous Yokomo cars in that it features aluminum bulkheads and Teflon-coated shock absorbers.



ENDBELLS FROM HELL

Yokomo is one of only a handful of manufacturers worldwide that actually make the motors we use for electric R/C racing. Many domestic motor companies, like Reedy, B&R, and Revtech, use Yokomo motor components, e.g., endbells, armature blanks, cans and magnets. While I was looking for a Works '91, I learned that in Japan, Yokomo offers a new series of motors—the Wing system. This line consists of the Wing "stock" series (in Japan, "stock" means any turn motor that uses bushings instead of bearings), standard Wing motors and the Super Wing series of modifieds. The Wing stock motors are available in various winds (15 to 35 turns) and feature fixed timing and low prices. The Wing motors have cooling heat sinks, ball bearings, dry magnets and adjustable timing. The top-of-the-line Super Wing motors feature wet magnets, 1.3mm cans and machined aluminum endbells that effectively dissipate heat. I used a Super Wing 14-turn double in the Works '91, and all I can say is that I hope someone imports these things soon!

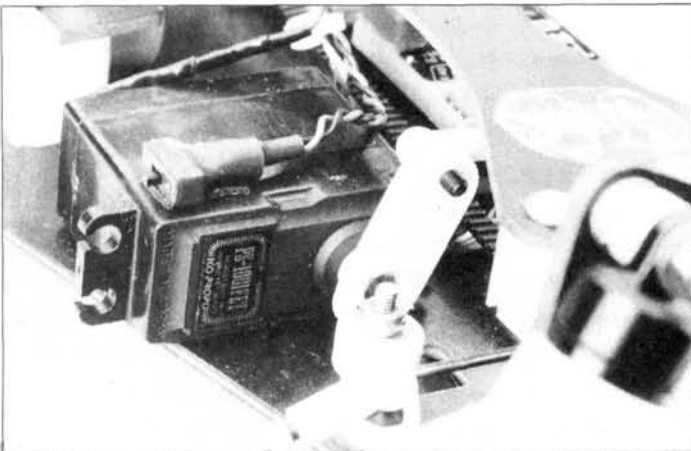
Works '91 uses new, black, fiberglass shock towers in both the front and the rear.

● **Additional features**—Rounding out the Works '91's impressive list of fea-

tures are long, universal-joint drive shafts for both the front and the rear (previous models used the long shafts for the rear only, and Yokomo offered them for the front with an optional wide front-end kit); a dual-bellcrank steering system with a built-in servo-saver; lightweight titanium turn-buckles for quick, easy tie-rod adjustment; and a sharp-looking polycarbonate body with a matching undershell.

INNER WORKS

Choosing electronics for the Works '91 required thought. I wanted a servo that would have enough torque to turn two driven front wheels, yet still operate quickly enough to handle the tightest of hair-pin turns. I chose KO-Propo's* 1001 FET Super Servo. This internally boosted servo has massive torque (over 100 ounce/inches) and a 60-degree transit time of 0.07 seconds! I plugged the 1001 into a Novak* NER-3FM 3-channel receiver—an FM unit that has been designed to work with Futaba's* Magnum PCM or Airtronics* Caliber 3P radios. Finally, a Novak NESC 410-M1c electronic speed controller channels the power from six Sanyo* 1700mAh SCE cells to the Yokomo Super Wing System modified motor (see sidebar).



Its 60-degree transit time of .07 second makes KO Propo's new PS-1001 FET servo the world's fastest. It also produces more than 100 ounce/inches of torque!



BIG WHEELS KEEP ON TURNIN'

In Europe and Japan, the maximum off-road wheel diameter is 2.2 inches, while in the U.S., ROAR allows only a 2.150-inch rim. Racers in the States have felt "left out" because they haven't been allowed to use the 2.2-inch tires, which offer superior performance, especially on harder surfaces. To find a way around this rule, racers have been gluing rubber bands to the 2.1-inch, ROAR-legal rims to accommodate the 2.2 inch tires. Yokomo is taking the U.S. market very seriously; the wheels on the Works '91 are a ROAR-legal 2.150 inches, and they even come with their own rubber bands!

SUPER DOG SETUP

As a starting point, I set up the Works '91 in the following manner:

• **Shocks**—I used the stock pistons and filled the front shocks with a 50/50 mixture of Associated's 30WT and 40WT silicone shock oil; I filled the rear shocks with straight 30WT oil. When you fill the shocks, be sure that you leave enough air in them to allow room for the oil

that's displaced by the shock shaft when the shock is compressed.

• **Static Adjustments**—Front toe: wheels straight ahead—neither toe-in nor toe-out. Front camber: approximately 1 1/2 to 2 degrees negative camber (tops of wheels leaning in)—slightly more for a high-speed track. Rear camber: approximately 1

degree negative camber.

• **Ride Height**—Front: Arms *slightly* above level. Rear: drive shafts level with the ground.

• **Differentials**—Front: shouldn't slip at all under the motor's power. Adjust the slipper on the main shaft so that it slips a little when you apply full throttle. Rear: grasp the spur gear and one rear tire. It should be difficult to turn the other rear tire.

YOKOMOTION

If you've never driven a 4WD car before, try it! The Works '91 is as stable as any 2WD car I've ever driven, and its acceleration and braking are phenomenal. The Yokomo turned in well, and allowed me to apply throttle immediately as I drove into the curve. Part of the car's turning ability must be credited to the KO servo, which gave the fastest steering response that I've ever seen. It

takes a little more tuning to make a 4WD car jump as well as a 2WD (most likely owing to the car's weight distribution), but once it's set, a 4WD will put a 2WD to shame on virtually any track.

FINAL WORKS WORDS

If you've read up to this point, you're probably very interested in the Works '91. Unfortunately, if you live in the U.S., you won't be able to buy one of these cars yet (unless you've got some overseas friends). Owing to the car's relatively high cost and some differences of opinion concerning its design, Associated doesn't plan to import the Works '91 at this time. If, however, you can get your hands on one of these gems, I guarantee that you won't be disappointed!

* Here are the addresses of the companies mentioned in this article:

Yokomo, distributed by Associated Electronics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

KO Propo, distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.

Novak Electronics Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

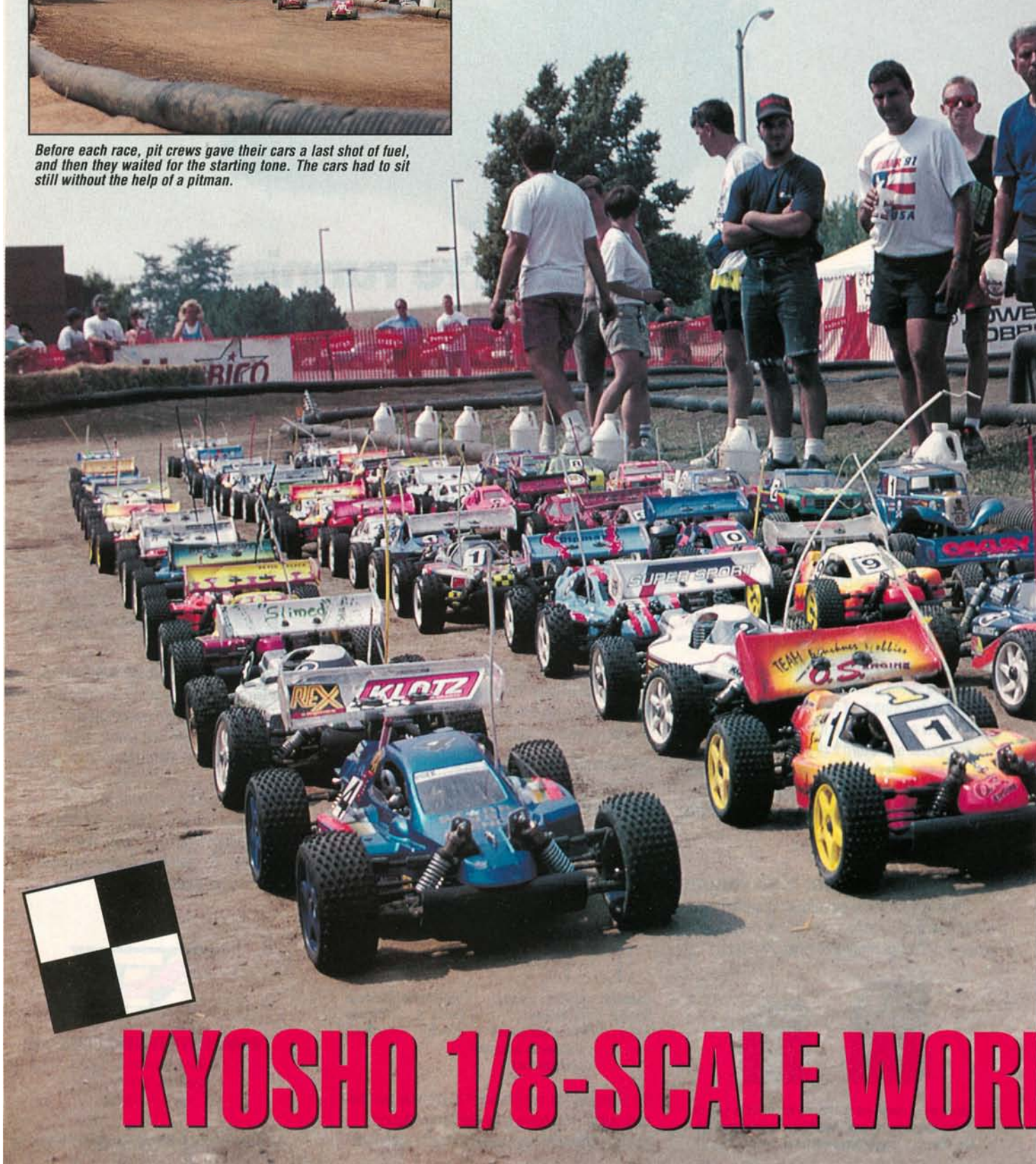
Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Sanyo Electric, 200 Riser Rd., Little Ferry, NJ 07643.



Before each race, pit crews gave their cars a last shot of fuel, and then they waited for the starting tone. The cars had to sit still without the help of a pitman.



KYOSHO 1/8-SCALE WORLD



by JOHN HUBER

ALTHOUGH there are several major on-road gas races in the U.S., there's only one large gas off-road event—the Kyosho 1/8-Scale Gas Off-Road World Challenge. The second annual Challenge was held on August 24 and 25, 1991 and, with well over 100 drivers and a new 1/10-scale truck class, it was larger than the Challenge of the previous year. Drivers from England, Japan and all over the U.S. journeyed to the Hobbico headquarters in Champaign, IL, to see what real racing was all about. For those who usually raced electric R/C cars, it was an incredible learning experience.

TRACK AND TRACTION

The superb track behind the Hobbico building serves as a testing ground for many of the company's products. Although it has loose dirt around the edges of the lanes, most of its surface consists of very hard, packed dirt. The giant U-shaped track is totally smooth and clear from the top of one side around to the top of the other side. Then there's a double jump, followed by the large "Mt. Kyosho" jump and a series of serpentine moguls that lead back to the smooth section.

Radio Control
CAR ACTION

WORLD CHALLENGE



The A-Main action between Johnson and Lett was close. Lett's car was powered by a Paris/Rex modified; Johnson ran a one-year-old Q.S. engine.

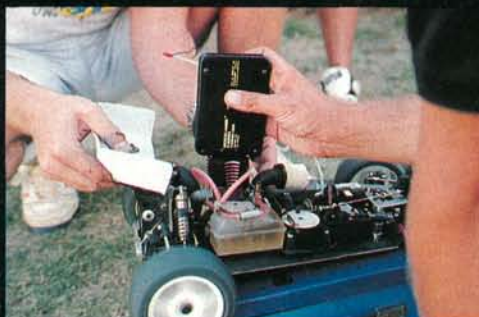


KYOSHO 1/8-SCALE WORLD CHALLENGE

PERILS OF POWER

At this race, it didn't take money to win. Sure, money played a part, but this event was more a game of consistency and skill. The first rule of thumb at an event of this kind is just to *race*. It sounds stupid, but to qualify in a good position, you must turn as many laps as possible. If your car stalls or overheats and you have to make a pit stop, it will cost you.

At the race, one misinformed racer used thread-locking compound on every bolt in his brand-new, expensive, top-of-the-line engine. Now, high-quality engines aren't just thrown together; they're calibrated. When this per-



son discovered that his engine wouldn't run well, he stripped the head bolts and tried to "rebuild" it. Out came the Dremel tool, and sparks began to fly. As you've probably guessed, his engine was "gargooned" after that. He had to buy a new one, and try to break it in and tune it at the last minute. Imagine how much money he could have saved if he had known how to work with and tune

his engine properly from the start.

Don't spend all your money on the hottest engine you can buy. Concentrate on learning how to tune engines properly, and then focus on the next important skill—driving. When you're a pro, you can go out and get that crazy 10-port engine!

Although the weather was hot, the officials decided not to water the track. Tires with softer compounds provided the best traction on the hard surface, but the 2hp machines and the 95-degree temperature caused them to wear very quickly! This caused a blue groove to appear around the fast smooth section.

A few drivers used the new Kyosho tires with treads that consisted of tiny dashes. They worked extremely well, but they only lasted 8 minutes. After that,

they were slicks; sometimes, they were even worn completely through! Most racers used Pirate X-pattern tires and foam inserts. They worked very well and lasted a long time. Eventually, the officials watered the track to improve the traction and to keep the dust down.

During the first day of qualifying, "Buggy Master" Cliff Lett did exceptionally well with his Pirate car. There were rumors that the Pirate cars had an advantage, because many of them used a one-

way drive system that some people thought contributed to their success.

Joel Johnson had trouble with the Rex and RX-B engines in his Burns. (Yes, even the pros have troubles!) On the second day, he replaced it with a one-year-old O.S. EX-B, and his problems were solved! Johnson cranked out a blistering 34-lap run that put him in the A-Main. It also put an end to the rumors that the Pirate had an advantage over the Burns!



This year's victors in the 1/8-scale buggy category: 1st place—Cliff Lett; 2nd place—Joel Johnson; 3rd place—Mike Cradock.

2WD TRUCK

Fin.	Qual.	Name	Country	Chassis	Engine	Pipe
1	2	Ian Oddie	UK	Kyosho Outlaw Rampage	O.S. CZ-R	Tuned
2	6	Kunio Dudgeon	USA	RC10T	O.S. CZ-R	N/A
3	8	Tom Grogg	USA	Kyosho Outlaw Rampage	O.S. CZ-R	Kyosho Stinger
4	4	Giti Gowland	USA	Prototype "Viper"	O.S. CZ-R	Viper
5	1	Steve Ozuna	USA	Kyosho Outlaw Rampage	O.S. CZ-R	Stock
6	10	Carl Christy	USA	Kyosho Outlaw Rampage	O.S. CZ-R	O.S.
2	3	Stewart Wilcox	UK	Schumacher Nitro 10	O.S. CZ-R	Scratch
8	9	David Sproul	USA	Kyosho Outlaw Rampage	O.S. CZ-R	Stock
9	7	John Stokes	USA	Kyosho Outlaw Rampage	O.S. CZ-R	N/A
10	5	Mike Cradock	UK	Kyosho Outlaw Rampage	O.S. CZ-R	O.S.

4WD

Fin.	Qual.	Name	Country	Chassis	Engine	Pipe
1	1	Cliff Lett	USA	Pirate M-1	Paris/Rex 6-port	Paris
2	2	Joel Johnson	USA	Kyosho Turbo Burns	O.S. EX-B	Pirate
3	6	Mike Cradock	UK	Kyosho Turbo Burns	Mondial	O.S.
4	7	Bill Jeric	USA	Kyosho Turbo Burns	O.S. EX-B	Kyosho
5	4	John Adams	USA	Pirate M-1	Rossi .21	Paris
6	10	Hiroshi Shudo	Japan	Kyosho Turbo Burns	O.S. RX-B	Kyosho
7	8	Mike Paganelli	USA	Kyosho Turbo Burns	OPS Pro	Paris
8	5	Steve Ozuna	USA	Kyosho Turbo Burns	O.S. EX-B	Paris
9	3	Ian Oddie	UK	Super Pirate	Mondial Pro	Mondial
10	9	Stewart Wilcox	UK	Super Pirate	Mondial Pro	Mondial



This was the first year that the Challenge featured a class for .12-size trucks. Here, Steve Pond's truck hammers on the competition.

QUALIFYING

The qualifying rounds began early Saturday morning. All the drivers had to complete in three rounds that day. This wasn't as easy as it sounds, because the races lasted for 10 minutes. (The trucks ran for 8 minutes.) Because most cars could run for more than 5 minutes on a tank of nitro, only one fuel stop was necessary. Some of the drivers had arrived early in the week to practice, and a few of them got their cars in and out of the pits in less than 4 seconds!

Mt. Kyosho was the track's most diffi-

cult obstacle. This 3-foot-high jump was followed by a 7-foot-long ditch. The drivers had to get their cars high enough into the air to take the jump and pass over the ditch, but not so high that they'd lose control. Experienced drivers knew that the horsepower of the engines would enable them to control the attitude of the cars in midair. If the nose was down, they blipped the throttle and it came back up; if it was up, they blipped the brakes and the car leveled off. (Yes, the cars were airborne long enough for the drivers to do this!)

By the end of the first day, the Mains had begun to shape up. In the A-Main, Lett had the TQ spot and England's Ian Oddie was right behind him. They were followed by John Adams, Steve Ozuna, Mike Cradock, Bill Jeric, Mike Paganelli, Hiroshi Shudo and Stewart Wilcox. There was still more qualifying to come, however.

Many of the same drivers who made the A-Main in the buggy class also made the truck A-Main. Although this class was much smaller, it was just as exciting. Because the trucks are so new, *no one*

Fuel	Radio	Tires (f/r)	Sponsors
N/A	Futaba	Losi Rib/Pro-Line Red	Ripmax
N/A	N/A	N/A	N/A
Cool Power	Futaba	Losi Rib/Pro-Line Red	Kyosho, DuraTrax, Hobbico
Giti Gas	Airtronics	Pro-Line 45/50	Viper, Pro-Line, Three Bimbos Racing
Giti Gas	Airtronics	Pro-Line 45/Stock	Kyosho USA, Giti Gas
N/A	Futaba	Kyosho Mini-spike	Kyosho, Futaba
N/A	Futaba	Losi	Schumacher, Pete's Awesome Modification
Cool Power	Futaba	Stock	Hobbico, Kyosho
N/A	N/A	N/A	N/A
N/A	Futaba	Stock	Ripmax, Futaba, Mondial

Fuel	Radio	Tires (f/r)	Sponsors
Power Curve	Airtronics	Pirate Hard	Associated, Pirate, Horizon Dist., Airtronics, Oakley, Team Moo
Custom	Airtronics	Kyosho Multi	Kyosho, Trinity, Airtronics
N/A	Futaba	SLD soft	Ripmax, Futaba, Mondial
Cool Power	Airtronics	Kyosho BSW-40	Kyosho, Tom Grogg
Power Curve	Airtronics	Pirate Mini-spikes H	Pirate, Horizon, RCPS, Cliff Lett School of Driving
Cool Power	KO	Kyosho BSW-40	Kyosho Japan
Omega	Futaba	Pirate Med/Soft	Bruckner Hobbies, More Wanted
Giti Gas	Airtronics	Kyosho BSW-40	Kyosho USA, Giti Gas
15%	Futaba	SLD Soft	Ripmax
15%	Futaba	Kyosho BSW-40	Ripmax, Futaba, Mondial, Belsport



Ian Oddie of Team Ripmax won the truck A-Main. He finished ahead of Kunio Dudgeon and Kyosho's Tom Grogg.



Cliff Lett gave his TQ prize to this lucky spectator!



Cliff Lett truly is the "Buggy Master." He cleaned up at this event with his Rex-powered Pirate.



Kunio Dudgeon's impressive customized RC10T handled well and finished 2nd in the truck A-Main.



At first, the track was very dry and dusty. Later, the officials watered it to improve the traction and reduce the dust.



Before the Mains, there was some time for demonstrations. This twin-engine Kyosho USA-1 was a real performer. The power produced by its synchronized .21 engines was a perfect match for its huge terra tires.



In the pit space under this tent, pros and amateurs worked side by side.



"Mad Mike Pags" of Team Bruckner Hobbies did well at his first gas race. His consistent runs put him in the A-Main, where he finished in 7th place.



With throttle control, the car's attitude can be corrected in midair.

knew much about them. The racing was very close—even between the beginners and the experts.

On Sunday, the last-chance qualifiers were run. With his fantastic run, Johnson was the only new driver to break into the A-Main. (He missed Lett's TQ spot by 6 seconds!) All the drivers made 32 or 33 laps; only Lett and Johnson made 34 laps. ROAR administrator John Thawley had

predicted that the drivers would need 32 laps to make the A-Main, and he was right!

FULL-TILT BOOGIE

Everyone looked forward to the A-Main buggy race in which the drivers would pilot their cars for 30 minutes. That's the equivalent of running an electric car in seven and a half consecutive races!

In this type of event, horsepower is just one of many important factors. The cars must be properly tuned, and the driver and the pitman must be able to communicate with each other easily during the race and through at least five pit stops. To accomplish this, some racers used small, wireless, voice-activated headsets similar to those used in full-size auto racing.

The 15-minute truck A-Main was conducted on a shorter track than that used for the cars. Most of the racers drove Kyosho Rampage trucks, but a Schumacher and two RC10 conversions also participated. (Kunio Dudgeon's RC10T conversion was a marvel of machining mastery that even Lett admired.)

At the start of the race, Oddie was at the front of the pack and moving fast. Cradock seemed capable of giving Oddie a run for his money but, halfway through the race, his truck overheated. Tom Grogg and Dudgeon staged a ferocious battle for 2nd place. In the end, it was Oddie for the win followed by Dudgeon, with Grogg close behind.

The start of the buggy A-Main was incredible; there's nothing like the sound of 10 nitro-powered .21 monsters screaming to be set free! When the clock started, the cars charged for the first turn in a blur of dust and smoke. Lett made good use of his TQ position and leapt ahead with Johnson and Oddie right on his tail. Lett held onto 1st place, but Johnson and Oddie were less than a quarter lap down. At the 16-minute mark, a suspension-arm broke on Oddie's Pirate, and this knocked him out of the race. After 20 minutes (and nearly 70 laps), Lett had only a 5-second lead on Johnson. Johnson headed into the pits for a blistering 3-second refueling by pitman Steve Pond. With 5 minutes remaining, Lett pulled into the pits and Johnson took the lead. But Johnson still had one pit stop left and, when he made it, Lett reclaimed the lead for the win. In the end, it was Lett, Johnson and Cradock (who just edged out Jeric).

THE CHALLENGE MET

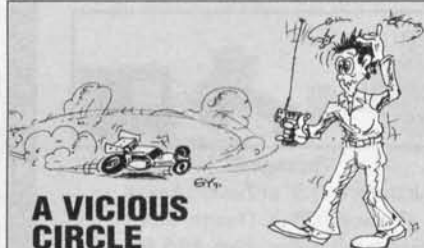
The success of the 1991 Kyosho World Challenge is proof that gas racing has caught on! The participants had the chance to race with some of the industry's top drivers, and having the best equipment wasn't the deciding factor. Instead, it took driving and tuning skills to win.

Thanks to Kyosho for staging this event. I hope they'll continue the Challenge in the coming years. In the meantime, look for a report on Lett's winning Pirate!

TROUBLESHOOTING

by FRANK MASI

Illustrations by GERRY YARRISH



A VICIOUS CIRCLE

I recently installed Associated's new Stealth transmission on my four-year-old basic RC10. Now the car keeps turning in circles. I've tried centering the front steering as much as possible. I've also tried new tires (for better grip) and a new motor (Trinity Nuclear Assault), and I've taken the transmission apart over and over, but nothing seems to help.

Also, the directions to my Novak T-4 ESC suggest that you mount the receiver and the antenna on top of the shock towers. I've asked every R/C car expert I know why, but no one seems to know the answer.

Mike Tanaka, Waianae, HI

It sounds as if the problem is in the rear of the car. My best guess is that something is amiss in the Stealth's differential. To determine whether this is true, install the motor in the usual way (with a pinion gear), and lift both rear wheels off the ground. Next, turn one of the wheels. The other wheel should rotate in the opposite direction. If it doesn't, or if the motor turns when you turn the wheel, then the diff hasn't been assembled correctly. If this is the case, refer to the instruction manual and carefully check each assembly step to see if you can find the source of the problem.

It's good to mount the antenna as high up—and as far away from the car's electronics—as possible. If you've mounted it to the chassis, and you haven't had any interference, then you don't have to remount it.

THE ULTIMATE SOUND AROUND!

My Ultima is very slow and very, very loud. My friend let me borrow his new RS-540 motor, but my car is still very slow and loud. The people at the local hobby shop told me to buy a new tranny, but it costs a lot of money. Is there something else I can do to solve the problem? If I have to buy new gears, which pitch and how many teeth? Please help!

Noel Caba, New York, NY

You probably only need a new set of internal gears (a differential gear and a transmission pinion gear) and maybe a new set of outer gears (a transmission counter gear and a cluster gear). Kyosho offers all of these through Great Planes Model Distributors, and they're reasonably priced. If you want to improve your car's performance, check out Thorp Mfg.'s (4054 E. Mission Blvd., Pomona, CA 91766) complete line of Ultima overdrive and underdrive cluster-gear sets. They let you alter the final transmission ratio. Thorp also offers a hardened-steel top pinion gear for the Ultima.



DOES HE HAVE A SCREW LOOSE?

I own a Junior Two with a Novak 410 M5 ESC, a Futaba Attack Sport radio, and a Cyclone II ROAR-legal stock motor. For some reason, the diff screw loosens very easily. Also, I'm a new R/C car enthusiast and any information you can give me on becoming sponsored would be greatly appreciated.

Patrick Garant, Roseville, MI

Your problem is a common one, Patrick. When Losi car and truck owners clean or rebuild the diffs, they often overlook the 4-40 nylon locknut that secures the diff-adjustment screw and preserves the diff settings. After it has been used for a while, this nut wears out and loses its ability to lock the diff settings. To prevent this, replace the locknut every time you clean or rebuild the diff. The nuts come with diff screws, and Team Losi offers them at a very moderate price.



Everyone wants to be sponsored. Unfortunately, there are only so many manufacturers. The best advice I can give you is to practice as much as you can, take the time to learn how your car works and how to tune it so that it performs well on any track. After you've become proficient, attend as many large races as possible. You never know....

If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.

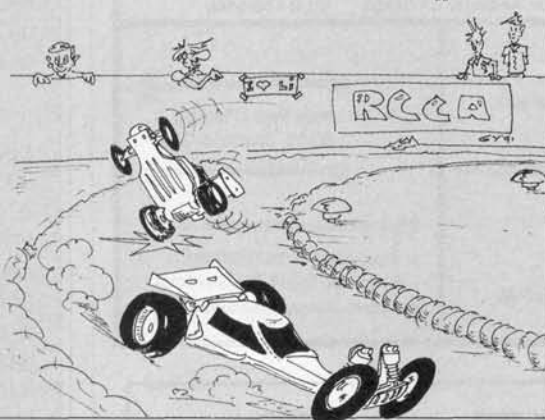
CRAZED RAIDER

I have a problem with my 2-channel Kyosho Impulse 11 radio. It works very well when I use it with my Raider ARR, but when I use it to race another car, my Raider goes crazy. The people at my hobby shop told me not use it with other R/C cars, but that's no fun. Which is the best radio for my Raider ARR?

Calvin Chanmany, San Francisco, CA

The cause of your problem is very simple, Calvin. The other car you drive is on the same frequency as the Raider. I can't believe your local hobby shop told you not to use your radio with other cars! At most races, as many as 10 cars can run at once, because the drivers' transmitters are all on different frequencies. At this year's R/C Thunderdrome race, an unprecedented 20 cars raced in a special A-Main!

To remedy the situation, buy an extra set of crystals for your radio, and make sure that they're on the proper band (27MHz or 75MHz). One crystal is for the transmitter (marked "TX"), and the other is for the receiver ("RX").



GEAR DOWN TO GO

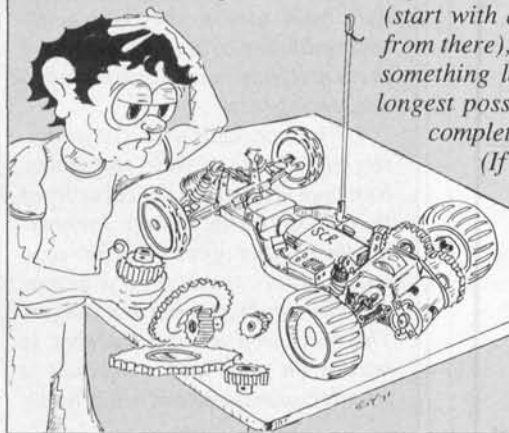
I've been racing my RC10 CE on an asphalt oval. I changed the tires, the gear ratio (I use 32-pitch gears—an 18-tooth pinion and a 48-tooth spur) and the suspension. It worked fine until I installed a Precision Motor Works Bad Animal-91 Hot Slot motor (no. 1691). Now, the battery doesn't last very long. I bought a 6-cell Sanyo Dynamite pack thinking it might last longer, but it only lasts for 3 minutes of a 4-minute race. How can I increase my run times? The class that I run in only allows 6-cell batteries and ROAR-legal stock motors.

Craig White, Mesa, AZ

You can do two things to increase run time: alter your gear ratio, and check that you're charging, discharging and storing your batteries properly.

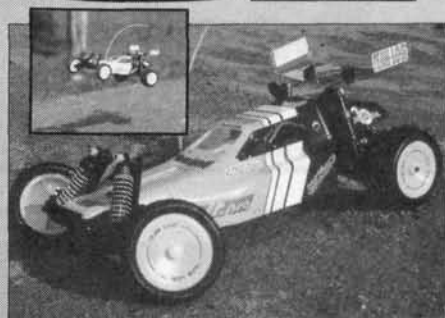
To last the required 4 minutes, you should switch to a smaller pinion gear (start with a 15 tooth and work up or down from there), or replace the 48-tooth spur with something larger. In addition, to obtain the longest possible run times, the cells must be completely discharged before each charge.

(If you run the car's motor until it no longer spins, the battery will be sufficiently discharged.) When charging, leave the batteries on the charger until they're slightly warm. If you use a charger with a timer, monitor the process carefully.



COMING NEXT MONTH!

TEAM LOSI
JRX
PRO
SE



FEATURES

Masami Interview
Project Blue Eagle
Home-Built Eliminator
Inside Masami's Stealth

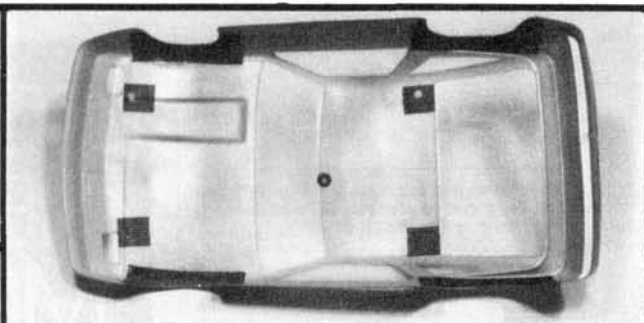
TRACK REPORTS

Bolink LTO SS
McAllister "00"
Russian Mockba
Royal Hyperspeed

R / C R A C E R

ROAR 1/8-Scale Nats
Off-Road Nats Winners
Hot Tracks
Speed Shop

Body & Fender Repair Kit



NEW !!! BODY & FENDER REPAIR KIT

TIP OF THE MONTH :

BODY REPAIRS

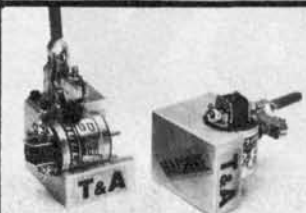
1. Repairing damaged bodies, maintaining and improving the aerodynamic designs of R/C car bodies with T & A Body & Fender Repair Kit.
2. Weak, damaged and unstable areas such as wheel wells and body post holes are prime targets for T & A Body & Fender Repair Kit.
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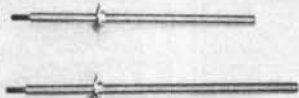
Thunder Gunk
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Ultra Light Aluminum Wheel Hubs



Kong Bone (Titanium)
RC-10, Dominator, SRP

1/10 Scale - 1/12 Scale
Super Pro Titanium Axle (Hollow)
Pro Titanium Axle (Solid)

Super Kong Bones (Titanium)
Associated RC-10 Stadium Truck

TROUBLESHOOTING



MOTORS FIT FOR A KING

A couple of months ago, I bought a Tamiya King Cab, and I built it myself. In "Project King Cab," [June '91 issue] the author used a B&R 13-turn, double-wind motor. Can I use this motor? I plan to buy a Thorp ball diff. What does the term "turn" mean? Also, what do servo-savers do? Can I use more cells in my car to increase run times?

J.J. Logan, Rocky River, OH

I wouldn't recommend that you use a hot modified motor, i.e. one with 13 turns, in a stock King Cab. Try motors in the 17- to 21-turn range. The addition of the Thorp differential will, however, enable you to use slightly more powerful motors. You might also want to buy Thorp's King Cab center-gear support bracket. It will strengthen the gear-box and prevent the premature gear failure that often occurs when you use hot modifieds.

The term "turn" refers to the number of times the armature wire is wrapped around the armature poles. The higher the number of turns, the longer the wire length will be. The longer the wire, the greater its resistance, and that means fewer rpm.

Servo-savers are simple devices that you attach to the output gear of a servo. Although they perform the same function as the arms that come with most servos, they're usually spring-loaded to absorb shock and prevent it from being transmitted to the servo gears.

Using more cells will, if anything, slightly decrease your run times. Run time is based on the capacity of the cell, not on the voltage. Increasing the number of cells will increase voltage (not capacity), so your motor will run faster, but not longer. This increased voltage, however, is harder on your motor because it speeds commutator and brush wear.

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Modena missile

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by ALEX STROUTHOPOULOS

PHOTO BY YAMIL SUED



TRACK REPORT

Ferrari

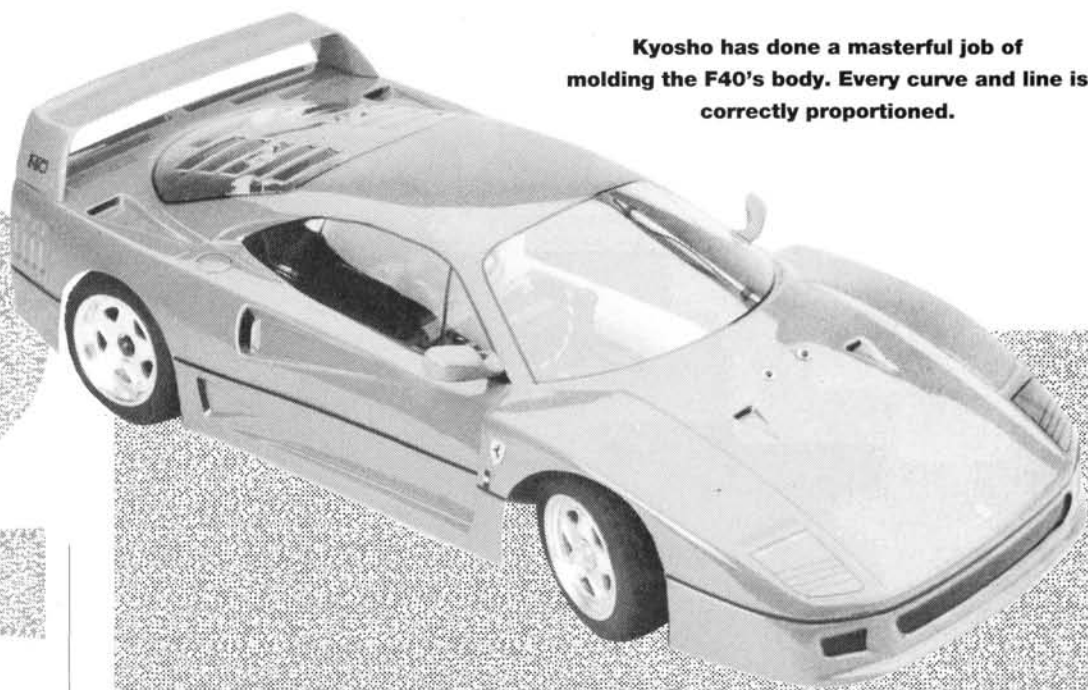
F40



THE Italian auto building firm of Ferrari has long been known for producing awe-inspiring, limited-production exotic cars. From the 512 Berlinetta Boxer to the latest version of the Testarossa, Milano-based Ferrari has been responsible for producing a majority of the world's most desirable cars. The F40 is one of Ferrari's latest offerings.

PHOTO BY DR. LOUIS V. DeFRANCESCO

Kyosho has done a masterful job of molding the F40's body. Every curve and line is correctly proportioned.



The F40 is essentially a race car in street-car trim. Rendered obsolete before release by the rules of its intended racing class, the F40 was retrofitted with suitable equipment to make it street legal (to meet safety and emission standards), and sold in limited numbers to an eager (and wealthy) public.

Kyosho*, in keeping with its trend of creating scale replicas of exotic cars, has reproduced the F40 in 1/10 scale. Based on the versatile Ultima II design, the Kyosho F40 has what it takes to do the name Ferrari proud.

THE KIT

On reading the instruction

manual, I learned that the F40 is mechanically similar to the off-road Ultima II (it shares the Kelron chassis and suspension), but that its ride height has been lowered with spacers inside the shocks. A set of chrome Ferrari look-alike wheels with treaded street tires replaces the Ultima II's spiked off-road tires and wheels. Other than these modifications, only the Ferrari body sets this car apart from its off-road counterpart. This is advantageous because using common chassis components for several cars limits the kit's price and makes replacement parts easier to find.

The kit was complete, and assembly went smoothly. After about four hours of work, I had the completed rolling chassis in front of me. The only complaints that I had were with the upper rods and bushings. The upper rods are a fixed length, and camber can't be adjusted to suit the car's handling. Although metal bushings are included for the tranny, plastic ones are supplied for the front wheels and rear hub carriers. After only a few runs, plastic bushings become worn and degrade performance markedly.

CAN YOU SPARE \$500,000?

Pure unadulterated power: that's the Ferrari F40. Enzo Ferrari's last car is his most powerful Ferrari. Celebrating Ferrari's 40th anniversary, the F40 is a throwback to a time when all a high-performance car needed was a powerful engine, a spartan interior, a manual transmission, and a rumbling exhaust—not leather interior, stereo or air conditioning.



These items are left out to make the car lighter and faster, and you can't go much faster than the F40's top speed of 198mph, or its 0 to 60mph time of 4.8 seconds.

What can propel 3,000 pounds of carbon fiber, Kevlar and aluminum to these speeds? A 3.0L V8, producing 478 hp at

7,000rpm, that's what. When coupled to the Ferrari 5-speed shifter, power is put to the ground in a major way. Not only can the Ferrari smoke virtually any car to 60mph, but it also meets U.S. emissions and crash standards!

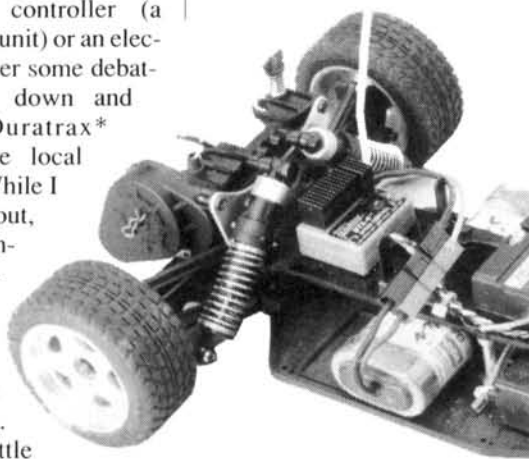
The F40's racing ability was tested when it competed in the IMSA GTO series six times; it won three 2nd places, a 4th place and a 6th-place finish. Very impressive figures for a street car, don't you think?

FINAL DETAILS

Radio gear isn't included in the kit, so I chose a KO Propo* EX-II. After I installed the PS-701 servo and the KR-288 receiver, I had a tough decision to make: whether to use the stock speed controller (a Kyosho rotary unit) or an electronic one. After some debating, I broke down and bought a Duratrax* DTX-4 at the local hobby shop. While I had my wallet out, I bought a Trinity* Slot Machine stock motor and a Speedworks* 1300 Sport Pack battery. With very little effort, I installed the speed controller and the motor; the last thing left to do was the body.

Kyosho has done a masterful job of molding the F40's body. Every curve and line is correctly proportioned. The rearview mirrors and the wing are molded of white ABS plastic, not clear polycarbonate, so you should paint them with a different paint than that used for the body. On clear polycarbonate bodies, you use a flat paint, because you paint the inside, not the outside. The polycarbonate body provides the shine.

When you paint the ABS parts with flat paint, you must give them a coat of clear gloss so that they'll match the body. I used Pactra's* Racing Red paint and Black Baron* Clear Gloss. I trimmed the body

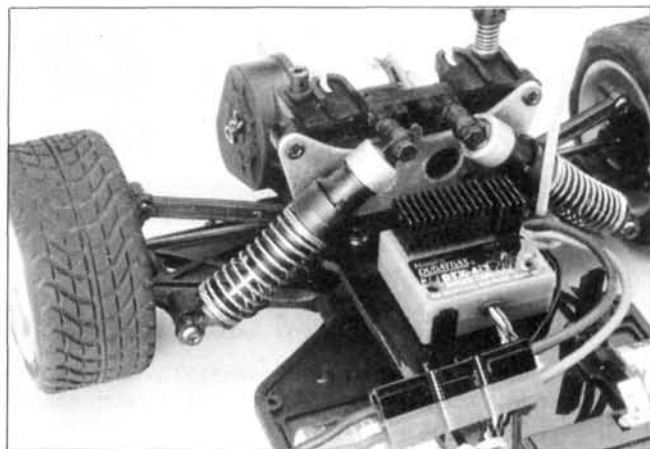


Based on the ubiquitous Ultima II chassis, the F40 shares many features with the other cars in Kyosho's Scale Series.

with an X-Acto knife, masked the windows and started to spray. After the paint had dried, I peeled off the window masking and went to work with the supplied decal sheet. Before I knew it, I had a beautiful replica of the fastest street-legal Ferrari.

TRACK TESTING

After I had peaked the Speedworks pack on my Tekin* charger, I drove to the local



Rear damping on the F40 is handled by a set of long Kelron shocks. Internal spacers limit their travel, lowering the car's ride height.



go-kart track for some testing. Although it isn't a competition race machine, the F40 handled remarkably well. The real thrill came from the car's appearance as it blasted down the short chute and powered out of the sweeper turn. After a few battery packs, I called it quits and went home with a smile on my face.

The aspects of the Ferrari that made this project enjoyable were its perfect scale appearance, its performance, and its simple assembly. The F40 is a delight for Ferrari enthusiasts or sports car lovers. Besides, where else can you get a Ferrari for under \$200?

**Here are the addresses of the companies mentioned in this article:*

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

KO Propo; distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.

Duratrax; distributed by Great Planes Model Distributors.

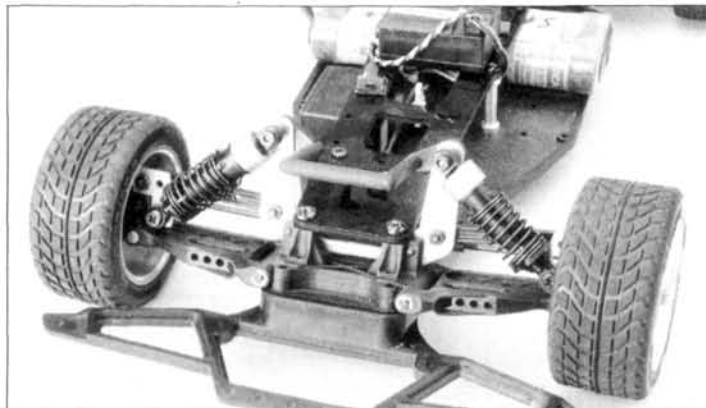
Trinity Products Inc., 1901 E. Linden Ave., Linden, NJ 07036.

Speedworks, distributed by Trinity Products.

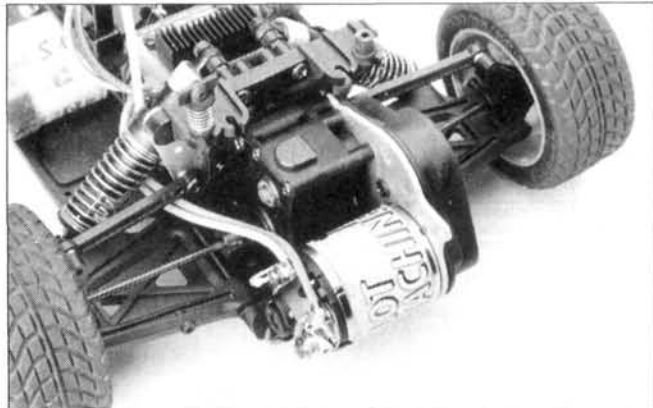
Pactra Inc., 620 Buckbee St., Rockford, IL 61104.

Black Baron; distributed by Coverite, 420 Babylon Rd., Horsham, PA 19044.

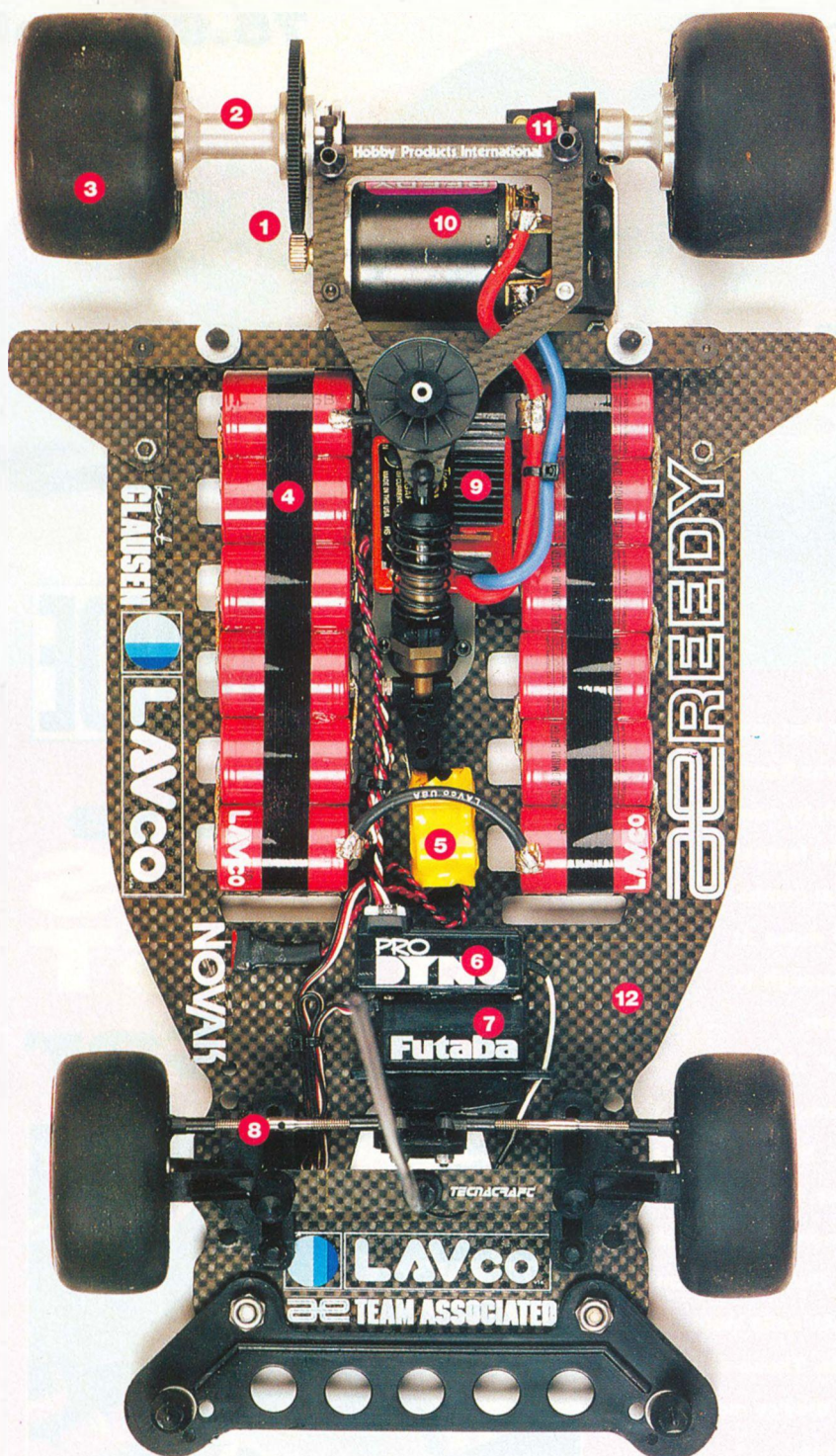
Tekin Electronics, 970 Negocio, San Clemente, CA 92672. ■



The front suspension uses Kyosho's Kelron shocks. They're mounted on brackets (attached to the caster blocks) to lower the front ride height. The bar across the shock tower is where the front of the body is mounted.



The F40's rear suspension has non-adjustable upper rods, and this limits the camber adjustment to the factory setting. A Trinity Slot Machine stock motor provides the horsepower.



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6.
Futaba 1024
PCM receiver

7.
Futaba S132H
high-speed servo

8.
Tecnacraft
steering linkage

9.
Novak 410-M5 ESC

10.
Reedy Mr. M
13-turn double

11.
HPI wing buttons
and mounts

12.
Associated Custom
10LSS chassis



TRC's new wraparound radials prevent the wheel's rubber cap from separating from the foam core.

pecially when you're traveling at 75mph! He also used TRC's* new radial tires that wrap around the wheels' sidewalls and prevent the blowouts that are so common at the Thunderdrome. These gold-compound radials are mounted on new composite rims that are rigid and good looking. Wheel disks completed this aerodynamic package.

Kent also used a Futaba* PCM transmitter and receiver. At a track of this size, you need all the reliability that you can get, and the PCM provides it. Because Kent was running 12 cells, he used an additional battery pack—five 50mAh cells—to power the receiver. For steering, Kent chose Futaba's S132H ball-bearing servo because of its ultra-fast action and small size, and he used Tecnacraft's* linkage to connect the servo to the steering blocks.

To ration the power to the motor, Kent chose Novak's* 410M5. Although it's rated for 10 cells, it can handle up to 12 (not recommended), but you'll sacrifice braking power. He mounted it on the T-plate underneath the shock, and this allowed him to connect the batteries to the ESC with the shortest lead wires possible.

To power his land missile to victory, Kent used a Reedy* Mr. M 13-turn double motor. Attached to the motor's output shaft was a Du-Mor* Star Force pinion that meshed flawlessly with the Star Force spur gear. The Du-Mor's narrow profile keeps drag to a minimum and

allows all the motor's power to find its way to the track. Kent completed his car with Associated's new narrow Jaguar body (no. 6125). Last year, there wasn't a large selection of bodies from which to choose, but several people ran narrow cars anyway. Many simply cut standard wide bodies in half and overlapped them until they were the proper width. Now, of course, there are many bodies that have been designed to fit narrow cars. Kent mounted the wing with HPI's* buttons and mounts, and this allowed him to use a larger diameter wing-mounting wire that resists flexing when the car is traveling 75+ mph.

Congratulations to Associated, Lavco*, Kent and all the people who helped make this the fastest Insane Run car ever.



After the 12 cells were installed, there was little room on the chassis, so Kent mounted the ESC on the T-plate.

*Here are the addresses of the companies mentioned in this article:

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Bud's Racing Products, 1575 Lowell St., Elyria, OH 44035.

TRC, P.O. Box 1058, Albemarle, NC 28001.

Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.

Tecnacraft, 1335B Dayton St., Salinas, CA 93901.

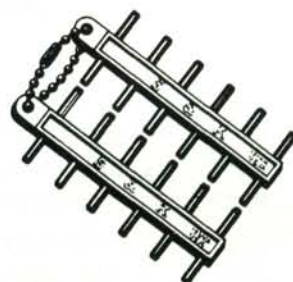
Novak Electronics Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

Reedy; distributed by Associated Electrics Inc.

Du-Mor R/C Inc., 1002 Union Landing Rd., Cinnaminson, NJ 08077.

HPI, 22600-C Lambert St., Suite 904, El Toro, CA 92630.

Lavco, 3150 E. La Palma, Unit B, Anaheim, CA 92806.



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TEAM Class News

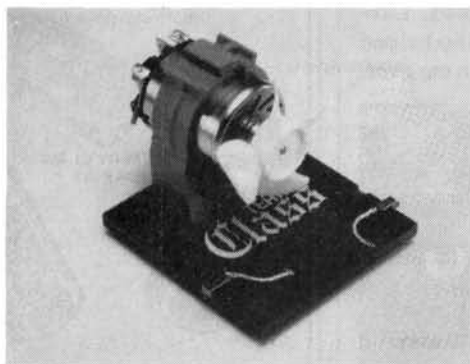
★ Team Class Brushes ★

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EYELETS

Part #	Description	Retail
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8002	Soft Venturi Brush w/eyelet	\$4.99
8011	Hard Full Brush w/eyelet	\$2.99
8012	Soft Full Brush w/eyelet	\$2.99
8021	Hard 1/2 Cut Brush w/eyelet	\$4.49
8022	Soft 1/2 Cut Brush w/eyelet	\$4.49

Class will still offer the full line of brushes *without* eyelets. Just change the first number in the part number to a "7". Example, #7001 - Hard Venturi without eyelet.



MOTOR MAINTENANCE CENTER

Part #6000

The Class Motor Maintenance Center (\$16.95 retail) is a convenient motor workshop that makes motor tuning much easier. The clip that holds the motor is superior to similar products currently on the market. Also, the stand has slots for custom brush cutting. You will also find a handy magnetic strip for organizing motor screw, springs, etc. The small fan, "Turbo Prop", is placed on the motor during break-in, this keeps the motor very cool.

On The Road With Team Class

Date: October 31 - November 3

Event: 7th Annual Chicago Model Show

Place: Chicago, IL

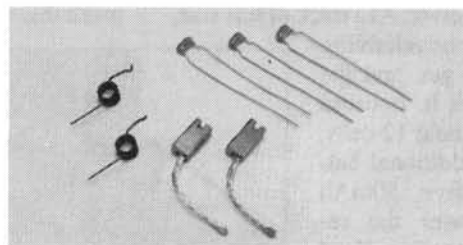
Both the president of Class, Richard Baker, and myself were in the windy city, Chicago, for the 1991 version of the Chicago Model Hobby Show. This was our first year at the show and it was really quite impressive. Most all of the manufacturers in the industry were in Chicago to display their current line as well as any new items that were available.

There are many things to do and see at the show. There is an offroad track in which you get a chance to drive some of the new trucks and buggies from various manufacturers. Also at the show is an R/C boat pond with many demonstrations held throughout the weekend. In addition, there is an IROC type race in which many companies donate various products to provide competitors with identically prepared 1/10th scale oval carpet cars. Many of the "big names" of the racing world were entered and this provided some very close racing. It was a hit with the racers as well as the spectators.

This show provided an excellent chance for us to meet with dealers and hobbyists from all over the U.S. and the world. It was great to get informative feedback from you guys and gals out there that are using our products. We will put this information to good use to improve our current line and when developing new items. We plan to attend next year's Chicago show and would highly recommend it to anyone, dealer, hobbyist or racer. See ya next year in Chicago, until then . . .

Keep racing and good luck.

Frank Calandra
Frank Calandra



STOCK MOTOR PERFORMANCE KIT

Part #7501

The Class Stock Motor Performance Kit (\$6.99 retail) is great for races with handout motors or when setting up new stock motors. The kit includes everything needed to get top performance out of stock motors — 3 high frequency capacitors, a pair of our legendary Venturi soft brushes and super heavy brush springs for low-end punch. This kit is being used by the fastest stock drivers around the country.

Class Recreational Products

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Utica, NY 13502

Telephone: (315) 724-8052

Fax: (315) 732-2034



LATELY, MORE AND more of you have been coming up to me at hobby shows and asking about taking a stab at R/C flying. I've even seen a few of you with kits (purchased at the show swap-shops) under your arms. Personally, I've found that some "3-D" R/C diversification has actually sharpened my car-racing ability. For those of you who aren't interested in this article, there's plenty of great car stuff elsewhere in the mag, so change the station. For those of you who've been asking about some "high-off-the-road-racing," turn up the volume and listen; starting isn't as hard as they'd like you to believe.

Although I'm sure that most of you don't realize it, the proficient car racer has already mastered the hardest part of



GET INTO R/C GLIDERS

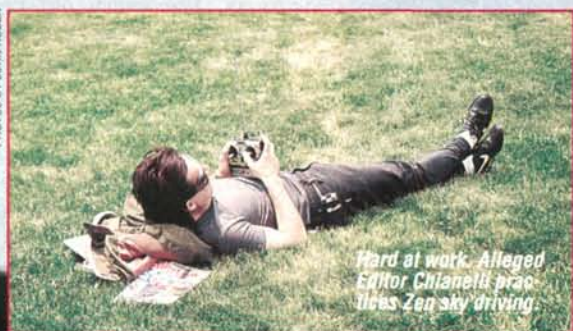
Sky driving



Tom Atwood, Model Airplane News' editor in chief gives the hand-launch.

by CHRIS "CRASH" CHIANELLI

PHOTOS BY JOHN HUBER



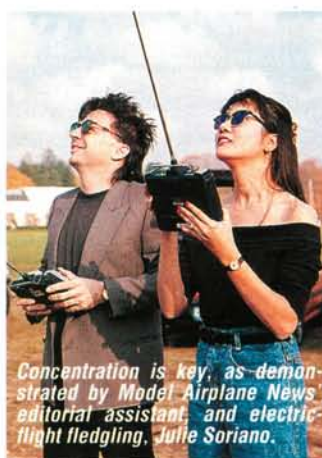
Hard at work. Alleged Editor Chianelli practices Zen sky driving.



"...the proficient car racer has already mastered the hardest part of R/C airplane piloting."

R/C airplane piloting. Some of you may have overheard those crotchety old R/C fliers patting themselves on the back about how they've finally mastered the difficult feat of flying. Well, the fact that they can't see as well as they used to isn't the reason it was so hard for them—although it didn't help any! Had they been car racers first, they'd have spent a lot less time cussing and kicking what was left of their crashed models around the flying field and spent more time getting kicks from some R/C pylon racing. It's quite simple. The hardest part of car driving—getting the hang of right and left when the car is coming toward you—is also the hardest part of R/C piloting. I've taught a few good car drivers to fly—and land!—a model airplane in less than two hours.

Thomas Atwood he finds it hard to cheat. Naturally, I don't, and I feel absolutely no remorse whatsoever when I slip in a hot-wind motor and pushed cells when Tom isn't



Concentration is key, as demonstrated by Model Airplane News' editorial assistant, and electric flight fledgling, Julie Soriano.

looking. The point is, there's a lot of fun to be had in the air as

stick-pack and a 540 motor, which all of us car people already have. Just remember, you *can not* use a car radio: it won't have the range necessary for flight and it will be on a channel that is illegal for anything but surface use (according to FCC law).

You don't have to join a club to fly, but it will put experience at your disposal. Electrics can be flown anywhere there's enough open space. If you aren't going to fly at an established R/C flying field, be sure that you're at least 5 miles away from the nearest one, or your radio might shoot down other fliers.

R/C planes can be dangerous (imagine losing control of an airborne racer), so most fliers have some form of insurance. Call the Academy of Model Aeronautics at 703-



Yours truly in total command—as usual.

Boy, does that rattle those old crabs!

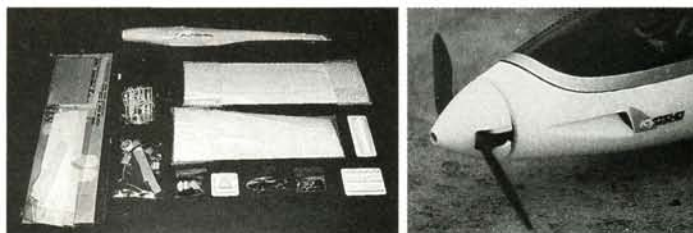
Tom Atwood—the editor-in-chief of *Model Airplane News* (a sister publication)—and I sometimes spend our lunch hour at a local soccer field "pylon racing" with our

well as on the ground.

You also have a head start when it comes to equipment. You can use your chargers, batteries, motors and electronic speed controllers in many of the gliders on the market. The Kyosho Stratus 2000

435-0750 or the Sport Fliers Association—800-745-3597—for details.

If you follow the building instructions to the letter, your electric glider will be a great source of excitement and will greatly improve the way you use your depth perception—something that separates the good drivers from the great drivers. For every old crab who gives you the "it's very technical stuff, son" line, there are probably 50 who will help you along, if you just ask. The best way to get even with the old buzzards who won't help is to come back in a few months and fly circles around them!



Above left: The Kyosho Stratus 2000 kit is highly prefabricated; only the final assembly steps are left to the modeler. Above right: The collapsing prop is powered by a 540 motor and a 6-cell flat-pack—sound familiar?

Kyosho* electric gliders; of course, I always beat Tom because there are no ROAR rules, and with a name like

that Tom and I use is a highly prefabricated kit with readily available spare parts, and it flies well. It also uses a 6-cell

* Here's the address of the company mentioned in this article: Kyosho/Great Planes Model Distributors; P.O. Box 4021, Champaign, IL 61824.



Our Basics of Radio Control Sailplanes covers all aspects of building and flying R/C sailplanes. It's available through Air Age's mail order department.

LETTERS

(Continued from page 11)

to push batteries on a Turbocharger. My sources tell me that pushed batteries will perform better than non-pushed initially, but they have a tendency to "drop off" more quickly.

• It's good to collect the items you've mentioned and contact your local recycling center about the proper procedure for disposing them. You might be able to dispose of your NiCd batteries locally, but I've also heard that you can send them back to the manufacturer for recycling.

• You should replace the Rulon disk in the Stealth tranny's slipper when the action becomes gritty or inconsistent. Sometimes, though, you can remove the disk and sand it lightly with a fine-grit paper to restore it to proper condition.

• Akerman effect positions the inside wheel of a cornering vehicle at a greater angle than the outside wheel, essentially because of the different radii each wheel is traveling. To improve the car's stability under high cornering loads, Masami reduced some of the Akerman—something that many on-road racers do using center-point steering. FM

LET'S TALK TERMS

I'm relatively new to the R/C car hobby but, thanks to your fine magazine and the Car Action books, I'm learning very fast and loving it. I read every tech article available, and I take notes and review them often. Although certain terms come up repeatedly, their definitions aren't always clear and seem to be used in contradictory ways. What is truly meant by the terms: "oversteer, understeer, loose and pushing." Basic adjustments for each would also be a great help. Maybe an article about just these problems would help some of us break out of the novice class.

I read your magazine every month from cover to cover. I like the "Track Directory" (especially the new one). I'm a trucker, so I'm on the road a lot, and this directory has been very useful. I've visited some of the tracks you list, and I plan to visit and compete at many more. Thanks for a super job!

DAVID SHISLER
Milton, FL

Being on the road a lot, David, you must have some serious subscription problems, eh? To answer your questions: the terms "understeer" and "push" refer to the

(Continued on page 156)

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SCOPING OUT

by JOHN RIST

Tekin 411G

HIGH-FREQUENCY (HF) electronic speed controllers (ESCs) are now the dominant forces in racing. I recently attended the U.S. Open-Wheel Dirt-Oval Championships held in Sugar Hill, GA, and out of the 40 A-Main cars, 20 listed HF, and three listed normal frequency controllers. The remaining 17 listed only brand names, but not model numbers. From what I saw walking around the pits, I'm sure that most of these 17 were HF, and this made HF-style ESCs the overwhelming majority at this race.

Tekin* had a very strong finish with two firsts, two seconds, and three thirds in the four A-Mains (two modified and two stock motor classes). The Tekin of choice was the TSC-411P. I got really excited when I looked at its specifications and realized that my 411G had the same features as the 411P with even better performance. Could it be that I had in my hands the ultimate weapon for next summer's racing program? In an effort to determine if this was true, I decided to put the 411G through the "Scoping Out" process.

The 411G has these features:

- six Goldfet transistors (five for forward and one for reverse);
- super high-current recharging diode;
- 13-gauge wire;
- multi-layered circuit card to reduce "on" resistance;

- surface-mounted components for smallness;
- high-frequency, linear-current motor drive;
- regenerating battery circuitry;
- extra orange grounding wire;
- electronic BEC bypass switching.

The 411G comes with an instruction book, heat sinks, several choices of receiver plug, mounting tape, adjustment-hole plugs, motor capacitors, cable ties, a Deans*

Power Plug, 6 inches of red 13AWG motor wire and a screwdriver.

Everything in the box looked first-class, and when I removed the controller from its case, I found a truly space-age ESC. (A good-looking case is nice, but it's what's inside that counts.) While I was looking at the 411G, I noticed that it had four wires going to the receiver plug instead of the usual three. (An extra orange wire is wrapped around the red, black and white wires). I also noticed a couple of black beads on the red and black wires right next to the receiver plug. By carefully reading the instruction book, I learned that the extra orange wire is what Tekin calls an "exclusive extra orange ground." According to the instructions, if you run an external receiver battery pack, you should remove the red and black wires from the receiver connector and insert the orange wire in place of the black wire. Tekin claims that with this setup, you'll increase radio range and reduce "servo hunt" for smoother, more

precise steering.

A close examination under a microscope and some checking with an ohmmeter revealed that the orange wire is connected to ground through a 4.7K ohm resistor. When you use the BEC to power the receiver, this extra orange ground wire acts like a shield to keep radio-frequency noise out of the receiver cable. To reduce this noise even further, the black beads on the red and black power leads are made out ferrite ceramic material, and this shorts out to any motor-generated RF noise that tries to sneak down the power leads into the receiver.

(Continued on page 90)

• THE SCOPING OUT LAB •

John Rist's lab consists of:

- an oscilloscope
- a digital voltmeter
- a resistor load bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors, which can be switched on and off one at a time to vary the load between .6 amp and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent .01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.

SCOPING OUT

(Continued from page 88)

TEKIN TSC-411G

DIMENSIONS:

Height 0.75 inch
Width 1.6 inches
Length 1.4 inches
Weight with wires 1.5 ounces

TUNING:

Access to controls Good
Ease of adjustment Fair

PRICE:

Sug. retail price \$190
Warranty 120 days

ELECTRICAL:

(Manufacturer's Specs)

Max. voltage 13.75 volts (11 cells)
Min. voltage 5 volts (4 cells)
Max. current n/a
Continuous current 300 amps
Resistance 0.0015 ohm

TEST PARAMETERS:

Voltage 6 volts
Current 2 amps
Voltage drop, full
length of wires 0.07 volt
Voltage drop at
2-inch point 0.05 volt
Resistance, full
length of wires* 0.0058 ohm
Resistance, 2-inch
wire point* 0.0041 ohm
BEC Voltage, 6-cell pack 5.38 volts

*Voltage Drop / Current = Resistance

COMMENTS:

"Wow!" just about sums up my impression of this speed controller. The 411G has world-class low "on" resistance, high-frequency motor control, torque control, and it runs cool under a heavy load. This controller is well suited to just about any class of car, truck, or buggy. It's small enough to fit into 1/12-scale pan cars, yet it's strong enough to handle multiple modified motors. If you've never driven an HF-style speed controller, you'll be amazed at the smoothness and controllability of the 411G. This controller is a winner, and it will find its way into the winners' circle in both local and national events.

RESISTANCE TEST

Low resistance is probably the single most important indication of a good ESC. It's the controller's resistance that robs the motor of valuable voltage. It's also the controller's resistance that causes *all* the FET heating; therefore, the lower, the better. I always run the resistance test twice. First, I measure the resistance along the full length of the battery wires and motor wires. This measurement enables me to determine the controller's resistance as it comes out of the box.

Next, I measure the resistance 2 inches along the wires. This gives a standard reading that can be used to compare the various ESCs tested in the "Scoping Out" lab. I measure the voltage drop across the ESC with 12 amps of current flowing. Then I calculate the resistance using the formula: voltage drop divided by current equals resistance ($V/I=R$).

The end-to-end voltage drop with 12 amps of current flowing was measured at 0.07 volt. This means a resistance of an incredibly low 0.0058 ohm. The voltage drop at the 2-inch point with the same 12 amps flowing was a mere 0.05 volt—a mere 0.0041 ohm of resistance. This means that if you're pulling an average of 20 amps during a 4-minute race, your average voltage loss because of the 411G would be only 0.082 volt. Believe me, you can lose a lot more than this by leaving wires too long, by improperly securing your battery pack cells, or by making a poor solder joint.

LET-IT-COOK TEST

I ran this test by passing 22 amps of current through the 411G for 15 minutes. I do install the provided heat sinks for this test, but I don't provide any cooling air from a fan. After 15 minutes, the 411G's heat sinks were a little warm, but by no means would I have called them hot. The 411G with its world-class low "on" resistance is destined to be one cool contender!

DEAD-SHORT TEST

I place a shorting strap directly across the motor lead, which causes 40 amps of current to flow (the limit of my Lambda lab supply.) I let the controller cook for 1 minute at this 40 amps, hoping to trip the built-in automatic thermal shutdown. At

the end of the minute, however, the 411G's heat sinks were quite warm, but not nearly hot enough to burn your finger. It would take a ton of abuse to get this controller hot enough to trip the thermal shutdown. If you do force the 411G into thermal shutdown, you probably need to quit for the day, go home and solve some major problems. I feel certain that if you use the provided heat sinks and mount the 411G so that it gets adequate cooling air, it will run cool.

The instruction book informed me that the 411G has a fuse that's supposed to blow if you connect the controller to the battery backwards. It appears that the fuse is in line with the BEC voltage regulator only. If you connect the battery backwards, the controller draws a heavy dose of current through, perhaps, a diode in the BEC. This dose of current pops the 50A fuse and causes the battery pack to be disconnected from the BEC. With the 5.5 BEC voltage gone, the FETs can't turn on and are protected. Of course, this is speculation on my part regarding how the fuse might work, but it doesn't matter whether my theory is true or false; what matters is whether the fuse really works. To find out, I plugged a battery pack in backwards. The 50A fuse let go with a loud snap, and then all was quiet. To find out whether the controller still worked, I replaced the fuse and reconnected the battery correctly. A quick check revealed that the 411G was back to normal. Another "Attaboy!" to Tekin for providing us klutzes with an idiot-proof ESC.

With the battery connectors soldered into place, the motor hard-wired and the 411G anchored with servo-mounting tape to my 10L chassis, I was ready to head for the track. Believe it or not, it gets cold in Huntsville, AL, in November, so I'm grateful that Rick Chambers has built a monstrous indoor high-speed oval carpet track. The car is equipped with a Phoenix Motors A-Main motor, and I run a 6-cell SCR Sanyo battery pack. I geared the car to dump in 4 minutes. Believe it or not, when I got ready to run the car, I realized that I had forgotten to bring the 411G's heat sinks. I could have borrowed a heat sink from Rick, but I decided to test the controller without a heat sink.

The first run was screaming fast. It has

(Continued on page 114)

Radio Control **Racer**

- Team Losi/Kyosho 1991
ROAR Off-Road Nats
- Car Action Interview:
Ron Paris
- Know your capacity!
- Speed Shop





During qualifying, a large package addressed to Team Moo arrived. Left, one of the founders of the Team, bravely opened the box to find an exceptionally large bale of hay (obviously sent by a rival team). Moo...!

OFF-R

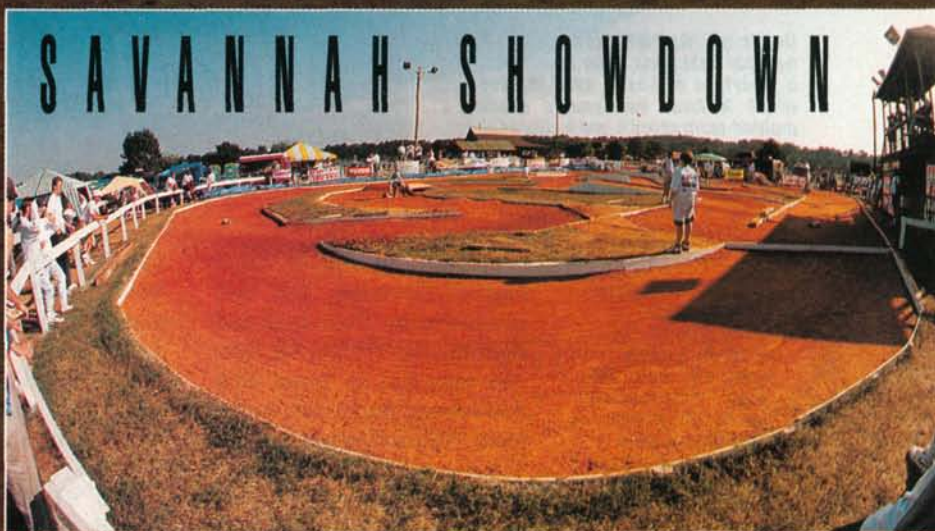


PHOTOS BY RICO SUAVE

RADIO CONTROL *Racer*



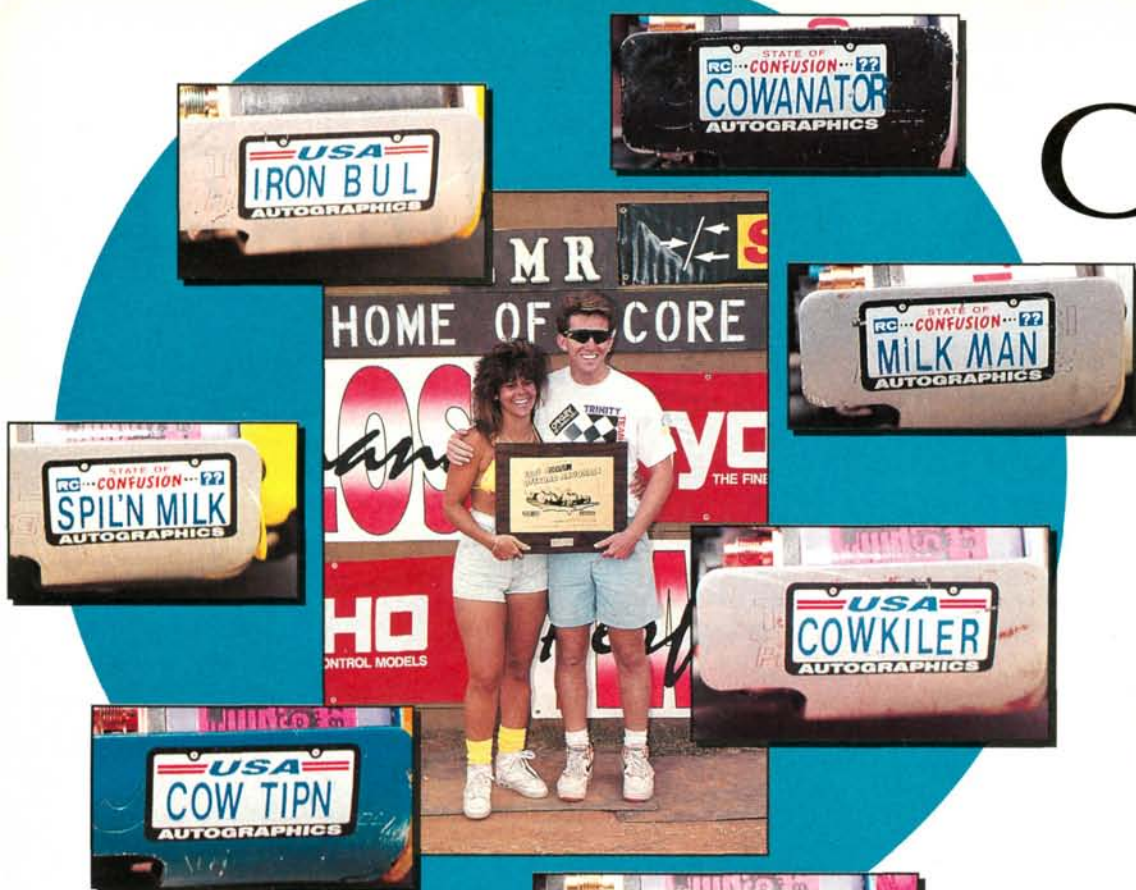
ONCE A YEAR, the very best off-road drivers in the United States gather to do battle, each seeking to claim the title of ROAR National Champion. Among dirt events, the ROAR Off-Road Nats is second only to the IFMAR Off-Road World Championships.



TEAM LOSI/KYOSHO **ROAR** OFF-ROAD NATS

by FRANK MASI

OFF-R



Here's the '91 2WD Stock and Modified national champion, Kyle Reed. Reed ran a prototype of Losi's new JRX-Pro SE, which features hard-coated shocks, a molded-resin chassis and a slipper clutch. Kyle and the rest of Team Losi sported license plates with definite attitudes.



park that has large parking and pitting areas, basketball and tennis courts, and even a small pond with paddle boats (site of the infamous Associated/Team Losi water-balloon war!). Everyone agreed that the track is absolutely one of the finest outdoor facilities they had ever seen. Its challenging layout boasts wide lanes and creative obstacles such as the "step-down, drop-off" jump, which was like a set of stairs! The track surface was—what else?—Georgia clay, and it remained consistent throughout the event (with help from the track maintenance crew, who diligently made any necessary repairs). At many tracks, qualifying times become progressively slower as the track deteriorates, but on this stable track, qualifying times grew progressively faster, as drivers became accustomed to the layout. Also, SCORE had planned for every possible contingency;

Team Moo headquarters was ready for any invasion from unfriendly outside forces with their "Moo Scud." Unfortunately, on its trial launch, the Moo missile made a premature splashdown in the duck pond.

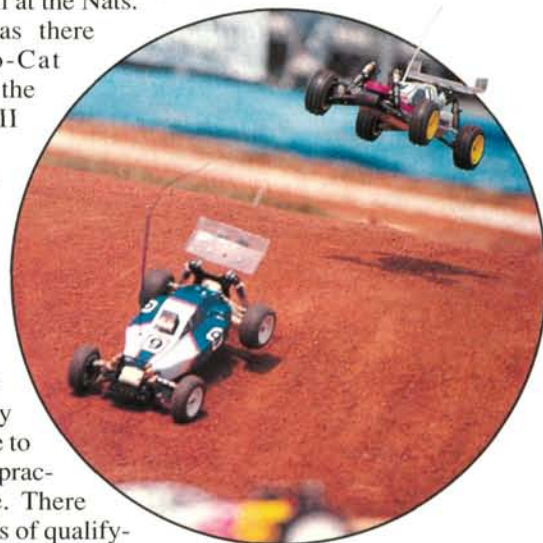
Hosted by the SCORE club of Savannah, GA, and sponsored by Team Losi and Kyosho, the '91 ROAR Nats was attended by more than 450 racers, and every major team was represented. From Team Associated came drivers Cliff Lett, Brian Kinwald and Rick Vehlow. Team Losi was also out in force with Jon Anderson, Jack Johnson and Kyle Reed, and Kyosho, with its new Triumph 2WD and Lazer ZX-R 4WD cars, relied on the talents of Kris Moore.

Last year, there was a new force to be reckoned with—Traxxas and their new 2WD car, the TRX-1. Traxxas driver Scott Montgomery qualified

fourth fastest at the recent Worlds, and he was looking to do just as well at the Nats. Schumacher was there with the Pro-Cat 4WD cars and the new Cougar II 2WD.

The '91 Off-Road Nats were held from Thursday, September 26, to Sunday the 29th, but many racers arrived as early as a week before to get in as much practice as possible. There were four rounds of qualifying throughout Thursday, Friday and Saturday, and the Mains were held on Sunday.

The SCORE track is in a



they even covered the track with an immense tarp when the sky had threatened rain.



ROAD NATS

QUALIFYING

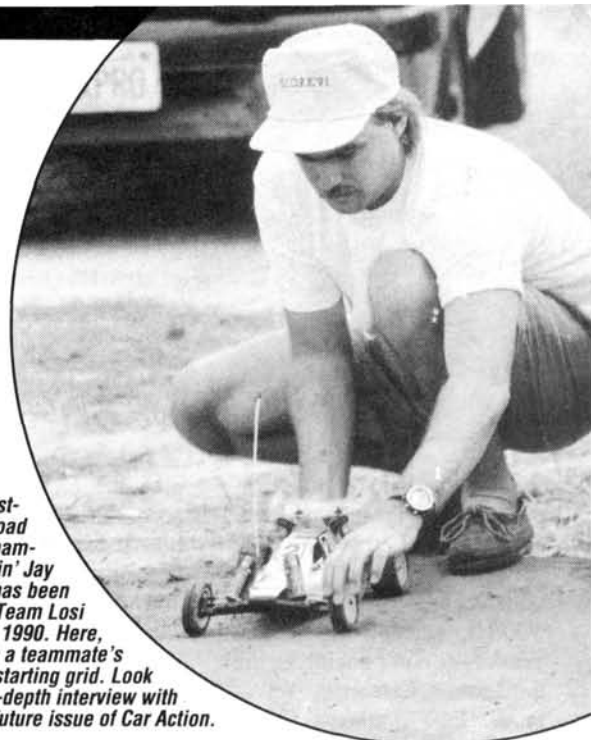
● **2WD Stock.** Early on, it became apparent that Team Losi would be the dominant force in the Stock Class, because many of their "big gun" drivers participated. Interestingly enough, most of Associated's top drivers don't enter the stock class because they think that it should be left to unsponsored competitive drivers.

Kyle Reed—1990's Stock Class national champion—was definitely looking for a repeat performance. He

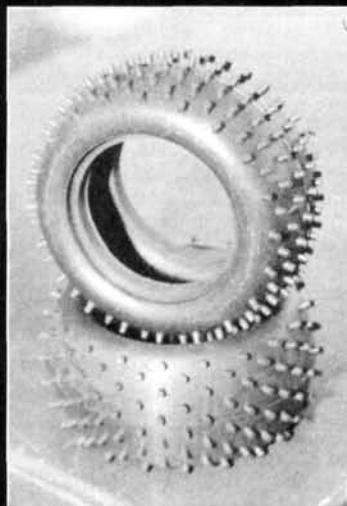
burned up the track to put his prototype JRX-Pro SE on the pole, and Losi pilots Scott Brown and Mike Tuntakit filled the 2nd and 3rd positions. Associated/Reedy's top stock qualifier, Matt Francis, was all set to sit in the 4th position on the A-Main starting grid. Owing to the track's stability, tire choice was straightforward throughout stock qualifying, with most drivers using Losi HT four-row rears and Losi HT ribs up front.

● **4WD Modified.** These guys were absolutely blistering! In

Right: the first-ever Off-Road World Champion, Jammin' Jay Halsey, has been racing for Team Losi since 1990. Here, Halsey puts a teammate's car on the starting grid. Look for an in-depth interview with him in a future issue of Car Action.

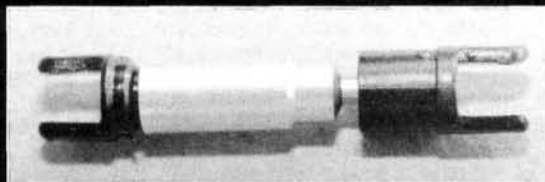


New Products at The Nats



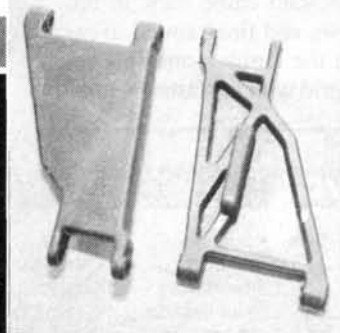
Traxxas

Here's the first tire in the exciting new Pro-Trax series. The 4751 mini-pin spike was developed for the IFMAR World Championships, and Carlos Gonzales used a set to TQ in the 2WD Modified Class. These tires will be standard equipment on the new Traxxas TRX-1 car.



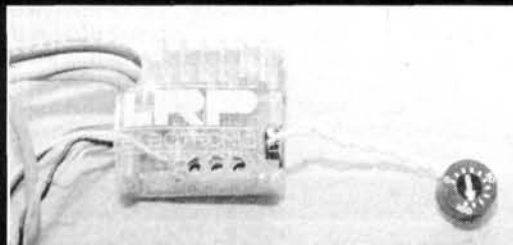
Schumacher

Schumacher's new alloy slider shafts are internally supported by bearings, so they're almost frictionless. You can mount them on any Schumacher car, but they're standard on the Team edition of the new Cougar II.



Schumacher

Check out these new front A-arms for Schumacher's Cougar 2WD car. They're designed to be more rigid than those on the standard Cougar, and they're "swept back" to improve handling. Molded out of Schumacher's Performance Engineered Polymer (PEP), these arms are standard on the new Cougar II.



Schumacher

Schumacher is working on importing LRP products from Germany. Shown here is the LRP LE 25 AMS electronic speed controller, which features incredibly low "on" resistance that allows it to be used without heat sinks. Also unique is the detachable torque limiter with metered potentiometer. The LRP line includes modified motors, too.

A&L Manufacturing

Initially campaigned at the IFMAR Worlds, this prototype 2WD racer made its second appearance at the ROAR Nats. Almost every component was hand-built by Chris Allec and Daryl Lane, and it features the Lethal Weapon transmission.

No word yet on availability, but we'll keep you informed.



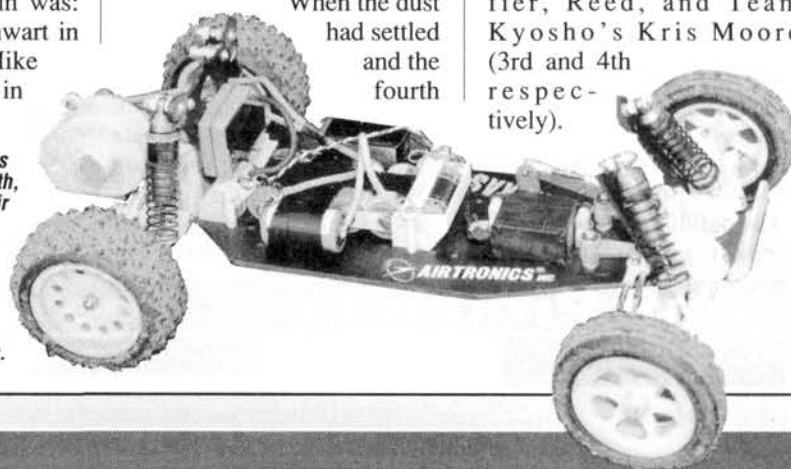


Left: Mike Reedy spent all four race days diligently working on his team's motors. An unsponsored driver blew up his Reedy motor at the Nats, and Reedy simply gave him a new one! Talk about satisfying customers!

round one, 4WD world champion and reigning national champ Cliff Lett set the time to beat with his Yokomo, which was a combination of YZ-10, scratch-built, and Works '91 components. In the third round, Lett's time fell to Peak Performance's Rick Hohwart, who drove a Kyosho Lazer. Not to be outdone, Lett came back in the fourth, and final, round to regain the number-one spot on the grid with the fastest 4 min-

utes the SCORE track had seen during the event! The lineup for the A-Main was: Lett on the pole, Hohwart in 2nd, Race Prep's Mike Dunn (Kyosho Lazer) in

Right: proving themselves a force to be reckoned with, Team Traxxas and their new TRX-1 placed cars in both the Stock and the Modified A-Mains. Shown is Scott Montgomery's car, which has Losi ball-bearing steering bellcranks.



3rd and Schumacher's Jonathan Morgan in 4th.

● **2WD Modified.** Qualifying for the 2WD Modified Class was the most hotly contested. The first round's top time wouldn't even have been fast enough to make the A-Main by the end of the third round!

When the dust had settled and the fourth

round of qualifiers had been completed, Associated/Peak Performance driver Carlos Gonzales had taken top honors with the only 11-lap run. Closely behind Gonzales came Team Losi's Jon Anderson, and he was followed by the Stock Class's top qualifier, Reed, and Team Kyosho's Kris Moore (3rd and 4th respectively).

4WD

Fin	Qual	Name	Chassis	Motor	ESC	Radio	Batteries	Body	Tires (f/r)
1	3	Mike Dunn	Kyosho Lazer ZX-R	Race Prep	Novak MXc	KO EX-1	Race Prep	Kyosho	Losi 4-row HT (f/r)
2	6	Brian Kinwald	Yokomo	Reedy	Novak M1c	Airtronics CS2P	Reedy	Assoc. ProTec 4	Losi 4-row HT (f/r)
3	7	Carlos Gonzales	Kyosho Lazer ZX-R	Peak 12Q	Novak MXc	Airtronics. CalSber 3P	Team Orion	Lazer ZX	Losi X-pattern HT (f/r)
4	1	Cliff Lett	Yokomo YZ10	Reed Mr. H	Novak MXc	Airtronics CS2P	Reedy	Yokomo Works '91	Losi 4-row HT (f/r)
5	5	Jon Anderson	Kyosho Lazer	Trinity	Novak M5	Airtronics CS2P	Trinity	Lazer	Losi 4-row HT (f/r)
6	9	Kris Moore	Kyosho Lazer	Twister 12T	Novak	Kraft	Max-Cell	Mid SE	Losi 4-row HT (f/r)
7	10	Mark Pavidis	Kyosho Lazer ZX	Reedy	Novak MXc	Airtronics CS2P	Reedy	Lazer	Losi 4-row HT (f/r)
8	8	Bret Reelfs	Kyosho Lazer ZX-R	Reedy Mr. H	Novak MXc	Airtronics CS2P	Turbo Cells	Optima Mid Custom	Losi 4-row/Pro-Line 7100
9	4	Jonathan Morgan	Scratch	Reedy Mr. H	LRP	Airtronics CS2P	Reedy	Pro-Cat	Losi 4-row HT (f/r)
10	2	Rick Hohwart	Kyosho Lazer	Peak 12D	Novak MXc	Futaba	Team Orion	Kyosho SP	Losi 4-row HT (f/r)

2WD Stock

Fin	Qual	Name	Chassis	Motor	ESC	Radio	Batteries	Body	Tires (f/r)
1	1	Kyle Reed	Losi JRX-Pro SE	Handout	Novak M5	KO EX-1	Trinity	Losi SE	Losi rib HT/4-row HT
2	2	Scott Brown	Losi JRX-Pro SE		Novak M5	Airtronics CS2P	Primetime	Losi SE	Losi rib HT/4-row HT
3	3	Mike Tuntakit	Losi JRX-Pro SE		Novak M1c	Airtronics	Trinity	Losi SE	Losi rib HT/4-row HT
4	4	Matt Francis	Associated RC10		Novak	Airtronics	Ultimate	RCPS Turbo Mirage	Losi rib HT/4-row HT
5	9	Jay Halsey	Losi JRX-Pro SE		Novak	Airtronics	Trinity	Losi SE	Losi rib HT/4-row HT
6	7	Greg Hodapp	Associated RC10		Novak M1c	Airtronics CS2P	Reedy	RCPS Turbo Mirage	Losi rib HT/4-row HT
7	10	Ron Rossetti	Losi JRX-Pro SE		Novak M1c	Airtronics Caliber	Trinity	Losi SE	Losi rib HT/4-row HT
8	6	Scott Moody	Associated RC10		Novak M1c	Airtronics CS2P	East Coast	Assoc. Viper	Losi rib HT/4-row HT
9	5	Tyrone Clark	Traxxas TRX-1		Tekin 411P	Futaba Sr.	Team Orion	Traxxas	Losi 4-row/Traxxas 4750 Med
10	8	Mike Mellin	Losi JR-X2		Novak T1-X	Futaba	Sanyo	Losi JRX-Pro	Losi rib HT/4-row HT

2WD Modified

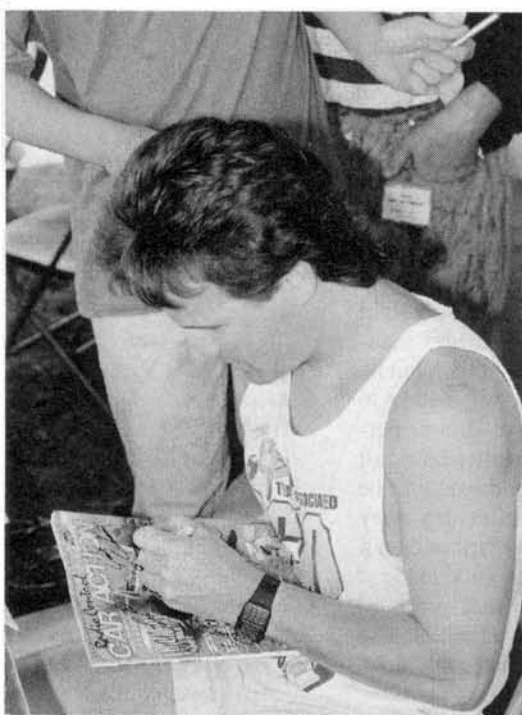
Fin	Qual	Name	Chassis	Motor	ESC	Radio	Batteries	Body	Tires (f/r)
1	3	Kyle Reed	Losi JRX-Pro SE	Trinity	Novak M5	KO EX-1	Trinity	Losi JRX-Pro SE	Losi rib HT/4-row HT
2	5	Brian Kinwald	Associated RC10	Reedy	Novak M1c	Airtronics CS2P	Reedy	RCPS Mirage SS	Losi rib HT/4-row HT
3	1	Carlos Gonzales	Associated RC10	Peak 15Q	Novak MXc	Airtronics. Caliber 3P	Team Orion	RCPS Turbo Mirage	Losi rib HT/Traxxas 4750
4	2	Jon Anderson	Losi JRX-Pro SE	Trinity	Novak M5	Airtronics	Trinity	Losi SE	Losi rib HT/4-row HT
5	8	Rick Hohwart	Associated RC10	Peak 15Q	Novak M1c	Futaba	Team Orion	RCPS Turbo Mirage	Losi rib HT/4-row HT
6	7	Scott Montgomery	Traxxas TRX-1	Peak	Novak	Airtronics	Team Orion	Traxxas	Losi rib HT/Pro-Line
7	10	Greg Hodapp	Associated RC10	Reedy Mr. B	Novak M1c	Airtronics CS2P	Reedy	RCPS Turbo Mirage	Losi rib HT/4-row HT
8	9	Jack Johnson	Losi JRX-Pro SE	Trinity	Novak M5	Futaba	Trinity	Losi SE	Losi rib HT/4-row HT
9	6	Mike Dunn	Losi JRX-Pro SE	Race Prep	Novak M5	KO EX-1	Race Prep	Losi SE	Losi rib HT/4-row HT
10	4	Kris Moore	Kyosho Triumph	Twister 12T	Novak	Kraft	Max-Cell	Triumph	Losi rib S/4-row HT

NATS

THE MAIN GAME!

● **2WD Stock.** From his 1st-place starting position, Reed shot into an early lead, with Losi teammates Brown and Tuntakit in tow. Team Associated's Francis managed to survive the first-corner confusion and tucked his Team Car behind Tuntakit.

Jammin' Jay Halsey spent a great deal of the race battling with Associated's Greg Hodapp for 5th position, but their duel allowed the four leading cars to pull farther away and move effectively out of reach. When the 4-minute buzzer sounded, it was the Losi freight train of Reed, Brown, and Tuntakit finishing 1, 2, and 3, with Francis bringing up the



Even though he was sick, overworked and not doing that well in the 2WD Class, Left always had time to sign autographs. He missed the A-Main at the Worlds because a youngster wanted his autograph. He obliged and missed a few seconds of his marshaling duties, and he was penalized. But he said he'd do the same thing again.

Sponsors

Race Prep, Kyosho, Novak, KO, Team Losi
Associated Reedy, Novak, Airtronics, Yokomo, Pro-Line, RCPS, Kimbrough, Team Waldo
Peak Performance, Kyosho, Novak, Team Orion, Pro-Line, RCPS
Associated, Yokomo, Reedy, Novak, Airtronics, Pro-Line, RCPS, Jammin' Products, Team Moo
Team Losi, Trinity, Kyosho, Jammin' Products, Novak, Airtronics
Twister, Kyosho, Novak, Max-Cell
Associated, Reedy, Airtronics, Novak, Kyosho, Pro-Line, Team Moo, RCPS, Oakley
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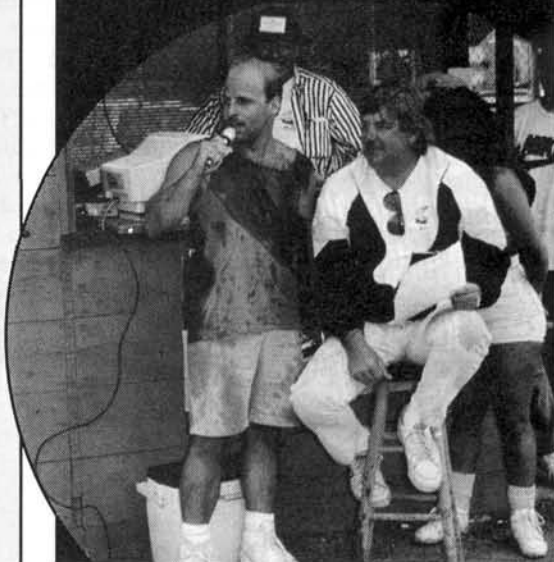
GETTIN' out of hand?

If you follow national-level racing, you're probably aware of what's called "team racing." It's just what the name suggests: teams compete, but they follow strategies agreed on by their drivers. Most complaints about these "strategies" stem from drivers who think they've been on the wrong end of a rival team's rough driving tactics. In the past, the most you'd hear about team racing would be mutters from a few drivers after their Main. Many would blame someone or something for their own poor performance.

At the '91 ROAR Off-Road Nationals, however, accusations of team driving and foul play came to a boil during the 4WD A-Main, and they continued after it. Many drivers exchanged heated words. And it doesn't help the image of these well-known drivers that some cheered when another team's driver crashed. C'mon, guys; your sponsors send you to these races specifically to show their products in the best possible way. Of course, winning a race helps sell car kits, but so does a team's good-natured trackside demeanor.

After the 4WD Main, several racers pointed a finger at winner Mike Dunn, accusing him of being a "hack." Dunn responded at the trophy presentation. Borrowing the announcer's microphone, he said, "It makes me mad when people cuss me out after a race and plot against me during it. I wish people would grow up a little bit and come here to race!" "Hack!" someone yelled from the crowd.

Did Dunn hammer his way to a national championship? Or are the allegations of rough driving simply sour grapes on the part of those who didn't win? No one can say for sure, but Gene Hastings, one of the owners of Associated, suggests that ROAR adopt IFMAR's policy of running three A-Mains instead of one. He also thinks rough tactics could be deterred by ROAR's requiring that two referees monitor the A-Mains at national-level events. Potential punishment for unnecessary roughness? Offenders wouldn't be eligible to compete in the next Nationals.

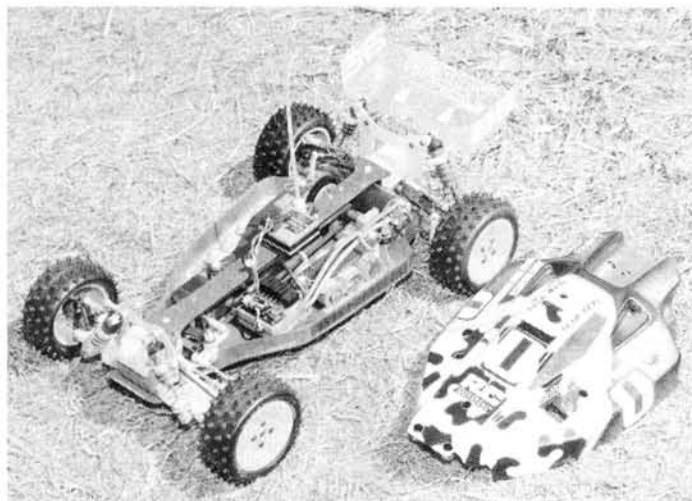


OFF-ROAD NATS

rear in 4th. Halsey managed to hold off Hodapp to capture 5th. Although the race was uneventful, the top four drivers put in flawless performances, all finishing less than 3 seconds apart!

● **2WD Modified.** Off the line, pole-sitter Gonzales and 2nd-place qualifier Anderson tangled, and this allowed 3rd-place qualifier and Stock National Champion Reed to take the inside line through the sweeper to shoot into the lead.

Fifth-qualifier Kinwald had woven his way around the chaos to take the 2nd spot right behind Reed. Gonzales managed to move up to 3rd, but he lost it almost immediately to Hohwart. Reed drove perfectly, but no matter how fast he went, Kinwald wouldn't be shaken. Lap after lap they went, never any farther than 4 feet apart. Hohwart made a rare mistake that allowed Gonzales and Anderson to slip by into the 3rd and 4th slots.



Above: Cliff Lett used this Yokomo to TQ in 4WD Modified. A combination of YZ-10 and Works '91 parts, Lett's Yoke also has many custom-machined components.

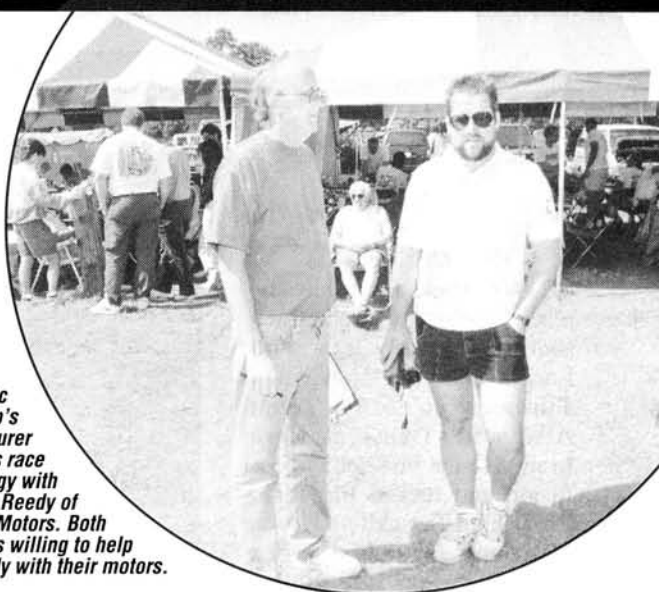
At the 3-minute mark, Kinwald stuffed into a board, and this gave Reed some breathing room as he went on to win his second national championship of the day.

● **4WD Modified.** The horsepower in this Main was incredible! The cars shot from the starting grid with dirt flying and motors whining. A huge pileup in turn two allowed Anderson's Kyosho Lazer to take the lead with Carlos Gonzales in 2nd and Hohwart in 3rd.

Up until then, third qualifier Dunn had been "picking off" one car at a

time and had taken over the 3rd position from Hohwart. Soon afterward, Dunn muscled his way past both Gonzales and Anderson to take the lead. Kinwald, who had been caught in the early pileup, steadily made his way to the front and held the 3rd position. With only 14 seconds left, Gonzales, who had been slowly making up time on Dunn, made an attempt to pass, but Dunn shut the door. Their cars tangled and Kinwald took the lead. Dunn dove inside Kinwald, forced him to the outside and regained 1st, which he held to the finish line, with Kinwald in 2nd and Gonzales in 3rd.

Trinity/Epic Motor Lab's Kevin Maurer discusses race strategy with Mike Reedy of Reedy Motors. Both were always willing to help everybody with their motors.



SEE YA NEXT TIME!

When the dust had settled, three ROAR national titles were awarded. Reed retained the Stock title and managed to add the 2WD Modified crown to his victories as well. Although it was a controversial Main (see sidebar), there was no argument that Dunn was, indeed, the '91 4WD ROAR National Champion.

I congratulate all the competitors—those who made the "A" as well as those who didn't. All of you deserve recognition for your immense dedication and hard work. Also, on behalf of *Car Action*, I commend Phil "The Colonel" Hurd and the entire SCORE organization for staging what must have been one of the most successful and well-run ROAR Nationals ever. You all did a bang-up job!

Reed retained the Stock title and managed to add the 2WD Modified crown to his victories as well.

The front drive system of MIP's newest 4WD conversion kit—the Legend—has the differential from Associated's Stealth transmission. MIP President Eustace Moore won the B-Main with a Legend.



SPEED SHOP

TRINITY PRODUCTS

• Psychotic Reaction Modified Motor



No other Pro Stock motor with Oilite bushings comes closer to providing sheer power than Trinity's Psychotic Reaction. Designed to be the fastest shock motor allowed under Outlaw rules, it uses the Trinity/Epic motor setup.

Part no. RC 2099

Price: \$28

For more information, contact Trinity Products Inc., 1901 E.

Linden Ave. #8, Linden, NJ 07036.

TEAM LOSI

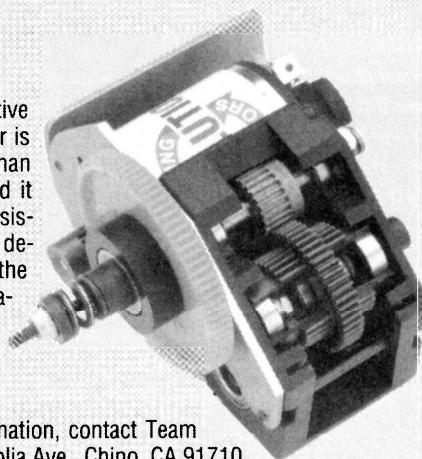
• Friction Slipper

This simple, effective friction-type slipper is easier to adjust than other versions, and it operates more consistently. It's also designed to accept the exciting new Hydra-Drive unit that will be available soon.

Part no. A-3110

Price: \$34.95

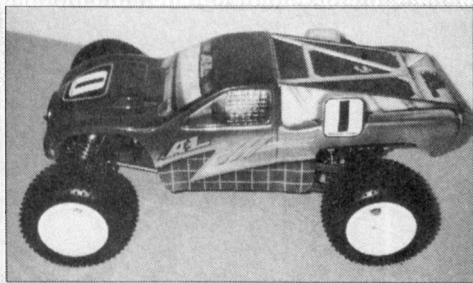
For more information, contact Team Losi, 13848 Magnolia Ave., Chino, CA 91710.



A&L MFG.

• Slam It Lower S10 Race Truck Body

With an ultra-low narrow fit and an aggressive, aerodynamic styling, Team A&L's new Slam It Lower S10 race-truck body has an all-out, race-ready appearance. Modeled after real stadium trucks, the body weighs only 3 ounces (painted and trimmed). It was used on the trucks



that won the Pro Stock Class the '91 NORRCA Nats and the Stock Class at the '91 ROAR Truck Nats. It features a long, slightly sloped windshield and a roll cage that channels under-

body air into a molded-in rear spoiler and an add-on spoiler that's mounted below it.

Part no. 9501

Price: \$19.95

For more information, contact A&L Manufacturing, P.O. Box 2115, Corona, CA 91718.

BUD'S RACING PRODUCTS

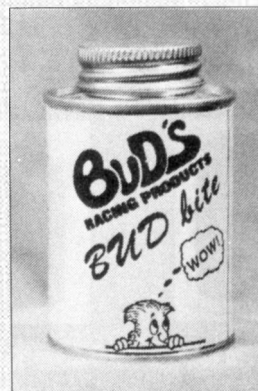
• Bud Bite

Just apply this special tire traction compound to your capped racing tires 5 minutes before you race, and then hammer down! It doesn't become sticky, so your tires won't pick up track dust. Seven out of 10 racers in the Modified A-Mains at the Oval Nationals used Bud Bite! Give it a try!

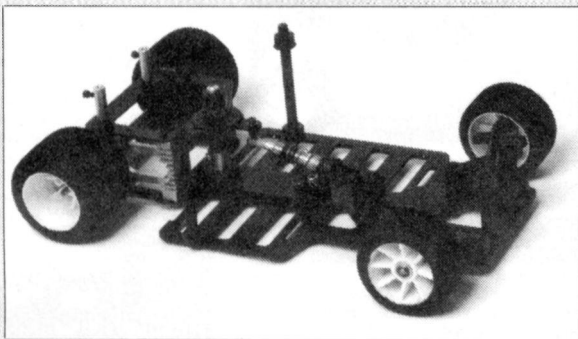
Part no. 6710

Price: \$7.95

For more information, contact Bud's Racing Products, 1575 Lowell St., Elyria, OH 44035.



Descriptions of the products shown on these pages were derived from press releases supplied by manufacturers and/or their advertising agencies. The information given is neither an endorsement of the product by *Radio Control Car Action*, nor a guarantee of performance or safety. If you write to the manufacturer about any product described here, be sure to say that you read about it in *Radio Control Car Action*.



C&M/TEAM COBRA

• LTOOR 12

This kit features a "pro" graphite chassis, a titanium pro diff, titanium turnbuckles, a heat-sink motor mount with adjustable ride height, a wide rear pod for easy motor access, a 5+3 battery configuration, a high-performance shock, ball bearings throughout and hardened chrome/moly, threaded front axles.

Part no. 7012

Price: \$215.95 (complete kit)

For more information, contact C&M/Team Cobra, P.O. Box 701-353, West Valley City, UT 84170.



AERO-CAR TECHNOLOGY

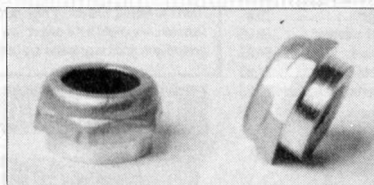
• Super Speed Gear & Diff Lube

Aero-Car Technology introduces a new lubricant for use in gearboxes and ball differentials. Developed for the aerospace industry, this lube can reduce amp draw by as much as 28 percent and increase ball-diff life by 250 percent. It's non-toxic and environmentally safe, and it won't harm plastic, nylon, or polycarbonate.

Part no. AC 1001

Price: \$5.99

For more information, contact Aero-Car Technology Inc., P.O. Box 336, Western Springs, IL 60558.



ENDURANCE RACING PRODUCTS

• RC10 Cut-Down Wheel Nuts

These wheel nuts are designed to reduce binding and friction. Unlike ordinary nuts that rub against the outer race of the front wheel bearing, these have been machined so that you can tighten them against the bearing's inner race.

For more information, contact Endurance Racing Products, 826 N. Lamb, Las Vegas, NV 89110.

TEKIN ELECTRONICS

• Dyno Motor Clamps

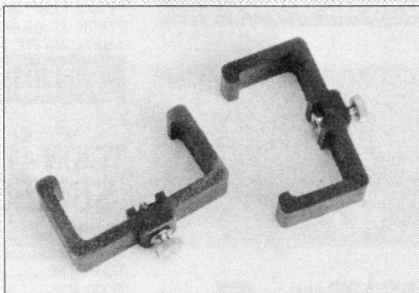
Tekin's new molded clamps replace the hold-down springs previously used to retain the slave motor and the test motor on the Tekin Digital Pro Dyno.

All Tekin dynos are now equipped with them, and they're also available separately.

Part no. DRP 006

Price: \$9.95

For more information, contact Tekin Electronics Inc., 970 Calle Negocio, San Clemente, CA 92672.



TMS PRODUCTS

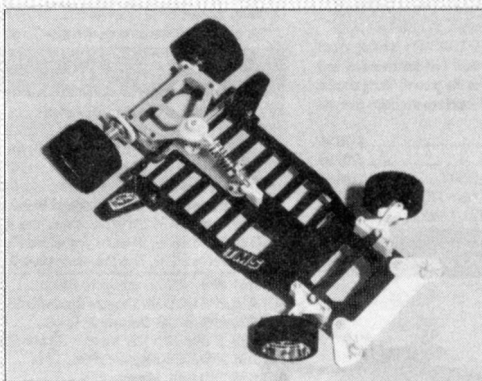
• RC10L Hi-Performance Graphite Chassis

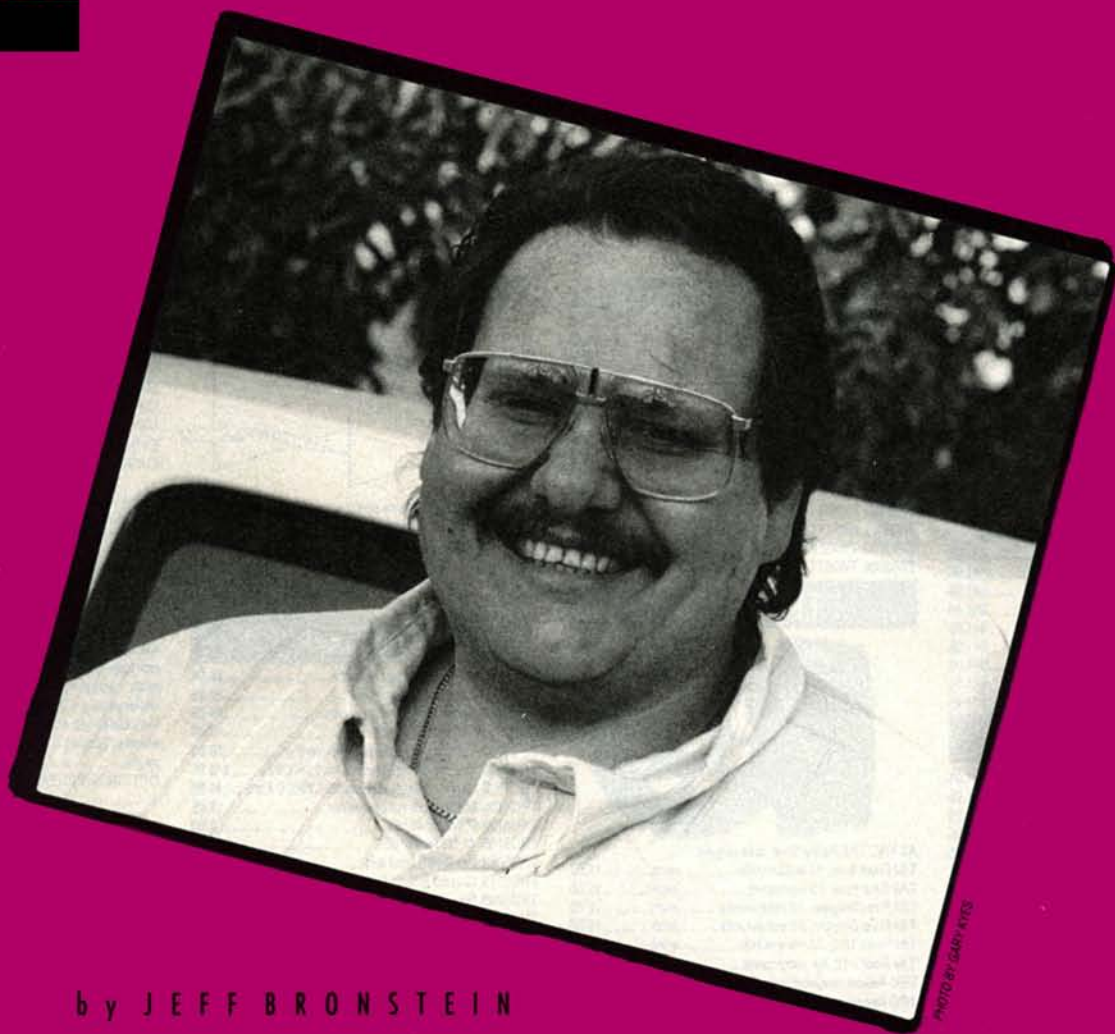
TMS created the Hi-Performance RC10L Pro Graphite chassis to excel on oval and on-road courses. It's narrower than the stock version, and it has been trimmed to eliminate all unnecessary material, so it's lighter, too. It also features battery cutouts that are .125 inch closer to the center (slots for seven cells on the left and for five on the right), and this makes it more balanced. Developed on a variety of short oval, long oval and on-road tracks, this chassis is one of the most efficient designs available for Associated 10L racers.

Part no. 206

Price: \$54.99

For more information, contact TMS Products, 1840 W. 220th St., Unit 360, Torrance, CA 90501.





by JEFF BRONSTEIN

MANY ELECTRIC RACERS won't recognize the name Ron Paris, but Paris Racing has produced some of the fastest gas R/C race cars in the world. From his beginnings in slot-car racing and full-scale performance mechanics, Ron has developed a thriving career as a specialist in high-performance R/C cars and micro-engines. Paris Racing is now represented by some of R/C racing's most successful drivers and, in conjunction with Associated Electrics, it has produced a winning record that's second to none. *Car Action's* Jeff Bronstein talked with Ron about some of the secrets of his success.

R O N

Secrets of the Motor Master

JB: Ron, you seldom grant an interview, so most people don't know you well—if at all. Let's start from the beginning. How did you get involved in R/C racing?

RP: I've been racing *something* all my life. I'd seen gas cars when they first came out, and 1/8-scale gas cars were all there were; there were no electric cars. I watched them, and they were pretty crude. In fact, whoever was able to finish would win, and I thought, "This isn't racing—it's more like luck of the draw." In about 1975, Leisure came out with a car that looked pretty good, and I walked into Thorp Raceway—now the Ranch Pit Shop—and asked John Thorp to sell me one. From then, it was non-stop.

JB: When 1/8-scale cars became available, how did you become involved with modifying the motors?

RP: I started with 1/12-scale, then went to 1/10-scale off-road. Then, when Pops Losi bought the track in Pomona, he convinced me to get a gas car. So actually it was *his* doing. I couldn't stand how slow the car was, so I started working on the K&B motors and made some pretty good power. Next thing you know,

I was doing engines for Junior and Pop and some other local guys at the track. Before long, I was buying parts from Dick McCoy, and Dick approached me about building and selling my modified motors.

JB: When you raced gas cars for the first time, were you a good driver?

RP: In my first McCoy race, I was in the D- or E-Main. Not very good! There were only pan cars then, and I said to myself that the next year I'd be in the A-Main. I bought a Delta suspension car, before Associated had come out with *their* suspension gas car, and actually finished building it in my hotel room in Ventura at the regionals. I made the A-Main that year. From then on, I was always competitive. I'd run about in the middle of the A-Main even when the big guys would show up.

JB: How did you become involved with Associated Electrics?

RP: Well, the Delta car handled pretty well on the track, but I was impressed by how the Associated team worked together. So I told Gene Husting that I thought I could be helpful and asked

him if I could drive an Associated car. He was reluctant, but he liked the way I helped people with problems in the pits. He sent me a car, and the first time I drove it I liked it, but I thought I could improve its performance by lightening it and modifying the engines. Gene and I hit it off. Gene and Midge [his wife] are two of the most awesome people you can meet. Without the support of Associated Electrics, Paris Racing would still be a small business; without them, it would never have happened.

JB: When did you make a conscious decision to make R/C racing a career?

RP: I made a conscious decision probably about five years ago. That's when I started getting serious about it. The R/C business was getting bigger and bigger, and when Pops decided to put 98 percent of his effort into off-road racing and get out of 1/8-scale, I decided to go out and do it on my own. I can't blame Pops, because off-road was getting pretty big, and he lost a lot of parking space at the Ranch. Without RPS, though, I had to bite the bullet and make a big investment in the business; I had to get serious. Pops headed me in the right direction, and now it's really

(Continued on page 134)

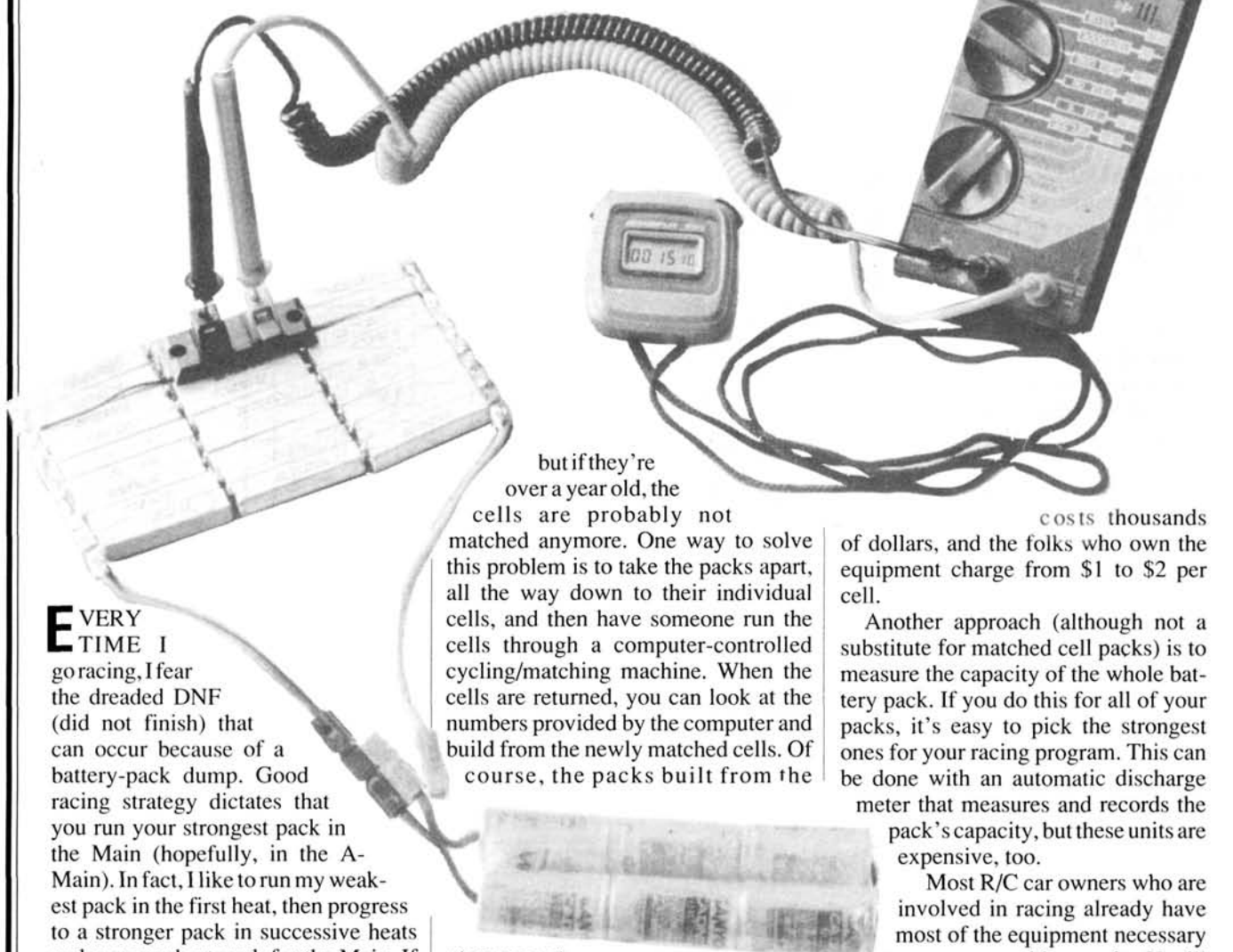
PARIS

Know

by JOHN RIST

Your Capacity!

HOW TO AVOID THE DREADED DNF



EVERY TIME I go racing, I fear the dreaded DNF (did not finish) that can occur because of a battery-pack dump. Good racing strategy dictates that you run your strongest pack in the Main (hopefully, in the A-Main). In fact, I like to run my weakest pack in the first heat, then progress to a stronger pack in successive heats and save my best pack for the Main. If I'm getting my doors blown off and I need to gear up for more speed, a stronger pack will lessen the chance of a battery dump.

I use matched-cell packs with the computer matching labels still attached,

but if they're over a year old, the cells are probably not matched anymore. One way to solve this problem is to take the packs apart, all the way down to their individual cells, and then have someone run the cells through a computer-controlled cycling/matching machine. When the cells are returned, you can look at the numbers provided by the computer and build from the newly matched cells. Of course, the packs built from the

strongest cells will be your best packs.

There are two things wrong with this: first, it takes a lot of time to take apart and rebuild four to six battery packs. Second, it's expensive to pay for matching cells. The cell-matching equipment

costs thousands of dollars, and the folks who own the equipment charge from \$1 to \$2 per cell.

Another approach (although not a substitute for matched cell packs) is to measure the capacity of the whole battery pack. If you do this for all of your packs, it's easy to pick the strongest ones for your racing program. This can be done with an automatic discharge meter that measures and records the pack's capacity, but these units are expensive, too.

Most R/C car owners who are involved in racing already have most of the equipment necessary to measure a pack's capacity. You'll need these items:

- peak-charger
- digital voltmeter
- stopwatch
- 20A resistive load

The first three items are easy to ob-

BATTERY DUMP CHART

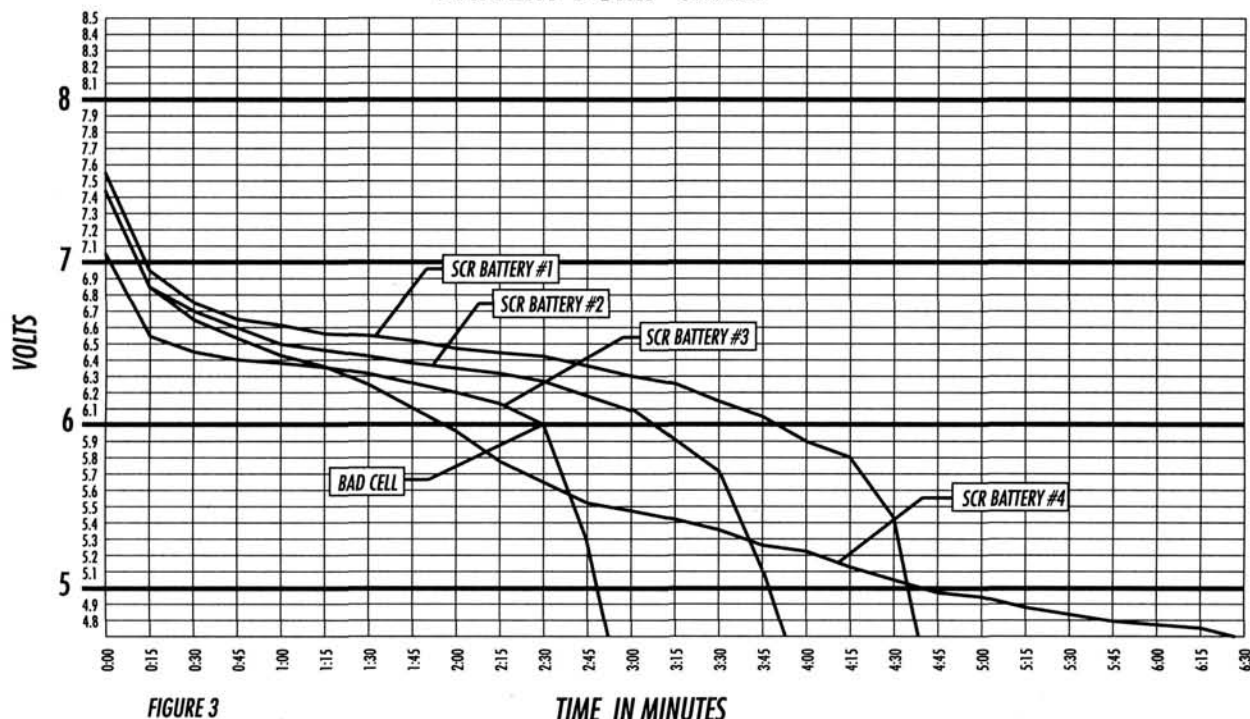


FIGURE 3

TIME IN MINUTES

BATTERY TESTS

With these items in place, let's look at the procedure I use to test my battery packs.

I try to test the batteries under the same conditions in which I race them. First, I make sure that all the batteries have been fully dumped. To do this, I plug them, one at a time, into a car and run them until they're flat. Next, I attach them to my Tekin* BC 100 charger and charge them at about 4 amps till they peak. When I race, I charge my battery packs the day before a race. On the day of the race, 5 minutes before each heat or Main, I peak-charge a pack. I always charge batteries the day before and peak them right before I test them. The procedure I use is as follows:

- Peak-charge all the packs that you plan to test the day before you actually test them.
- When you're ready to test the packs, connect the pack to be tested to the peak charger and let it peak. Make sure that the charger charges enough to warm the pack slightly.
- Attach the voltmeter to the resistor load, and get your stopwatch ready.
- Start the stopwatch, and quickly plug in the battery pack (you should be able to do this in less than a second).

• As quickly as possible, look at the voltmeter and record the zero-time voltage reading. The meter reading will be changing, so just write down the highest number that you see.

• With your stopwatch, record the voltage reading of the battery pack every 15 seconds. With a little practice, you'll find that you have plenty of time to read the meter and record the data. If you miss a reading, just let it go and record the next one. A missing data point or two won't affect the accuracy of your plot.

• Continue taking voltage readings until the battery voltage falls below 4 or 5 volts.

• Plot the data.

To demonstrate how well this works, I ran my collection of batteries through the process and plotted some of the more interesting curves on the battery dump chart shown in Figure 3. Curve no. 1 is for my strongest SCR pack. This pack starts out at the highest voltage and maintains this advantage throughout the dump. Curve no. 2 shows another of my race-worthy SCR packs. Curve no. 3 is an interesting curve because this pack has some bad cells. This can be seen as a sudden drop in voltage at the 2:30 time point. Obviously, I wouldn't use this

pack for racing. Curve no. 4 is of a 6-cell SCE pack. As you can see, it has a lower average voltage, but a longer run time. The lower output voltage is due to the SCE's higher internal resistance. I date and keep all my battery plots so that I can tell when a racing pack is weak, and this indicates that it's time to relegate it to practice-pack status.

CAUTION! The resistor bank gets very hot. A quick calculation ($6 \text{ volts} \times 20 \text{ amps} = 120 \text{ watts}$) reveals that the resistor bank is handling 120 watts. Think of it as grabbing a 100W light bulb; i.e., you could get burned! If you have a cooling fan that you use while charging a pack, it's a good idea to blow cooling air over the resistors when a pack is dumping.

So, there you have it. If you build a resistor load bank that costs under \$15, you should have all the equipment that it takes to measure the capacity of your battery packs. With this method and a little experience interpreting the voltage-versus-time curves, you'll be able to learn a lot about your battery packs before the big race—and thereby avoid the dreaded DNF.

**Here are the addresses of the companies mentioned in this article:*
Litespeed, P.O. Box 4765, Spokane, WA 99202.
Tekin Electronics, 970 Negocio, San Clemente, CA 92672.



"The Pit Challenge II" March 28 & 29

Las Cruces Hobby Raceway

1996 A. So. Valley Dr., Las Cruces, NM 88005 505-524-8530

R/C Off Road Racing
Roar Sanctioned #100392

Schedule:

Friday March 27 - Practice
10:00 - 6:00

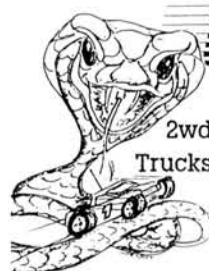
Saturday - March 28 - Stk Qualifying & Mains

Sunday - March 29 - Modified Qualifying & Mains

Everyone runs a main event

10 car mains - No bump-ups

Course: 4 right turns 5 left turns, double, triple, table top, two banked curves and plenty of other challenges track conditions considered memdium, X-patterns & Proline 7070 work well. Track Record is 10 laps, 4 minute heats & Mains. Will run 3 qualifiers & Main. 25ft drivers stand will easily hold 15 drivers. Wheel chair accommodations. Track and Pit area is outdoors, limited electrical outlets, however most everyone that needs it can be accommodated. Generators okay. Call for Hotel-Motel info. 505-524-8530.



ROAR

Classes:

2wd Stock * 2wd Modified
Trucks Stock * Trucks Modified

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Roar Rules Apply

Entry Fees:

\$25.00 per class

Stock classes must run a Roar Legal '91 stock motor

All Drivers must provide proof of Roar Membership

Memberships will be available at the track.

Autoscore

Entry Form: Make checks payable to and send entry to Las Cruces Hobby Raceway, 1996 A. So. Valley Dr. Las Cruces, NM 88005 505-524-8530.

Name: _____ Phone: _____

Address: _____

Classes: _____ Freq: _____

Roar # _____ "The Pit Challenge II" Amt Enclosed: _____

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SCOPING OUT

(Continued from page 90)

been a while since I drove on the carpet track and, to say the least, my driving was rusty. With the HF linear motor control working for me, however, the throttle response was so smooth that I was able to keep the car between the walls most of the time. After the 4 minutes, I ran over to the car and quickly checked for heating. The battery and motor were almost too hot to touch. I checked 411G's FETs and found that they were barely warm. We're talking blistering runs with no heat sink in place and absolutely no heating. This, of course, was no surprise to me. Show me an ESC that has a true 0.004-ohm resistance, and I'll show you a controller that runs cool!

Several people have asked me about this statement in Tekin's instruction book regarding torque control: "If the torque control is set too high, the power will fade excessively after a few laps, and the car batteries will dump quicker." Remember: anything that affects the current flow will affect run time. Historically, if run times were too short, you could install a smaller gear on the motor to reduce top speed and lengthen run times. This would happen because the motor would be working less, so the battery/motor current would be lower.

Now, with current control (torque control), it's possible to reduce the amount of current flowing to the motor by adjusting the control downward. Carried to an extreme, you can limit current to the point of hurting performance. I feel there might be a winning combination: slight over-gearing (too large a pinion), which you compensate for by limiting torque as much as possible. What I'm trying to say is that if bad gearing causes you to dump early, you can compensate for it by adjusting the torque control. Just remember that turning down the torque control hurts acceleration, and if it's turned down too far, it will hurt full speed. If you want to experiment with this tuning trick, I suggest that you start with the torque control set at maximum. Next, adjust your gearing until you fall slightly short of a 4-minute run. Then, adjust the torque control downward until run times are OK. Compare lap times using this setup with your times obtained when using your usual gearing and the torque control set to max. I think that a much better use of the torque control is to use it to limit acceleration when you race on a slippery road course.

I have two complaints about this con-

(Continued on page 126)



1990 REGION 3 CHAMPIONS
1990 REGION 6 CHAMPIONS
1990 PAVED OVAL NAT'L STOCK T.O.
1991 SHORT TRACK NAT'L MODIFIED T.O.
1991 HELLYER PARK VELODROME
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8 AM to 6 PM PACIFIC TIME

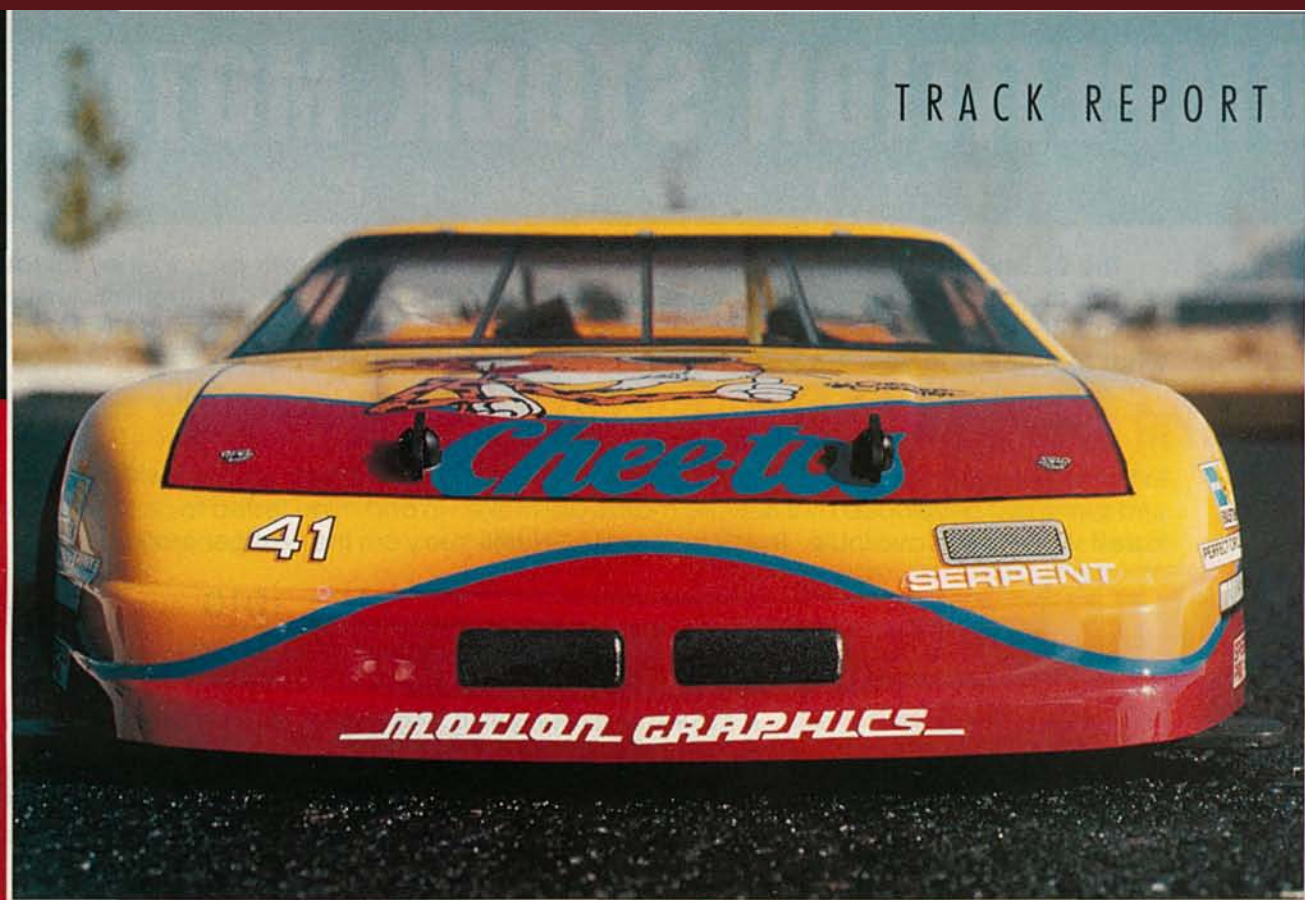
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by JEFF BRONSTEIN

IT HAS ALWAYS been hard for me to justify working on my 1/10-scale electric on-road cars for hours on end, just to spend 4 fleeting minutes mixing it up on the track. One-eighth-scale gas racing gave me an alternative with increased run time, and the guy out in front after 10 seconds wasn't always the winner; but I still hoped to retreat back to the smaller scale. The future of radio control may be the best of both these worlds: the speed and power of gas racing and the convenience of 1/10-scale's size.

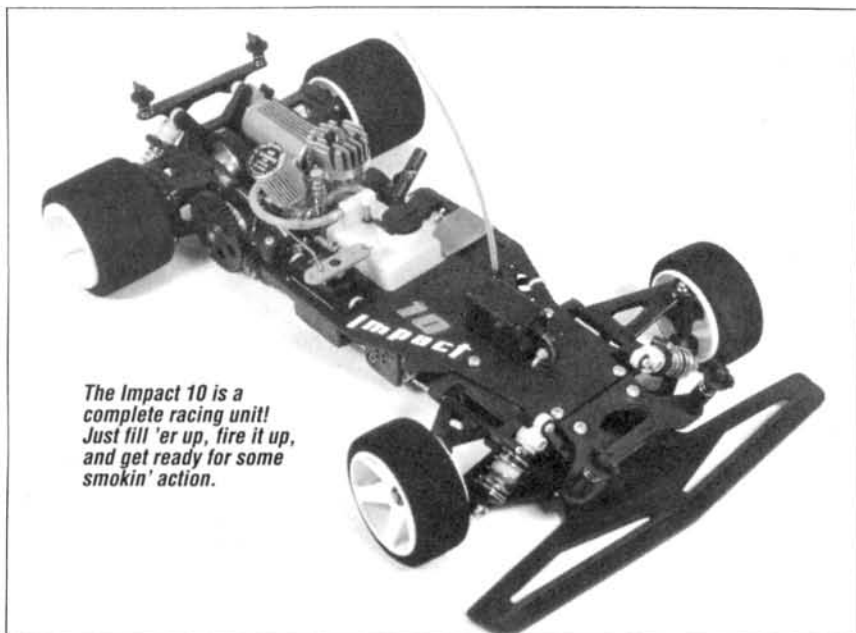
S E R P E N T

IMPACT 10



HIGH-SPEED
SLITHER

IMPACT 10



The Impact 10 is a complete racing unit! Just fill 'er up, fire it up, and get ready for some smokin' action.

PHOTOS BY JEFF BRONSTEIN

If you like $1/10$ -scale on-road racing, but you've always wanted to try gas, this car may be just what you're looking for. The Serpent* Impact 10 is the first $1/10$ -scale on-road car to break new ground in R/C racing. From Berton of

A simple design helps keep maintenance to a minimum. Much of the car comes assembled in a professionally packaged case. If you want to try out the car immediately (as I did), install the servos with a couple of tie-downs, put the receiver and battery pack between the radio tray and the chassis, and you'll be ready for action. To top off the Impact, I decided to use a kickin' Bolink* Chester Cheetos Pontiac, which was painted by master Muise at Motion Graphics*. It seemed only fitting that I should introduce this new car in style! I used my Airtronics* CS-2P radio and, just for grins, a new Novak* NER-3FM

narrow-band receiver. Any standard servo will fit, but remember, you'll need two.

TEAR DOWN

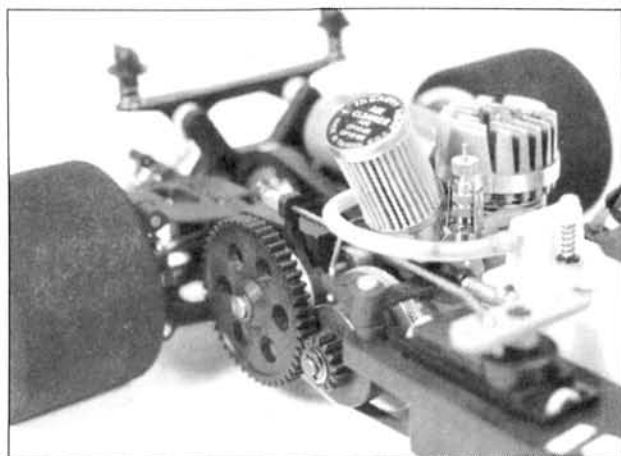
As a precaution, I disassembled the car to check for defects and weaknesses; I found that everything was in order. Even the pre-installed Magnum .10, which isn't one of my favorite engines, was clean and free of any casting flash. For convenience, the engine features a

recoil starter, but it can also be started with a standard bench starter. All the necessary throttle, brake and steering linkages are also included in the kit, and a very professional assembly manual helps you to complete the final touches.

Reliability is built into the car from the ground up. Most of the major suspension components have been adopted directly from the Impact's big brother—the Sprint 6020. The rigid nylon compound used in the injection-molded suspension arms, the bulkheads and the radio tray is light and strong enough to withstand most crashes. Chrome-plated pivot pins provide smooth, slop-free movement, and new plastic shocks provide damping.

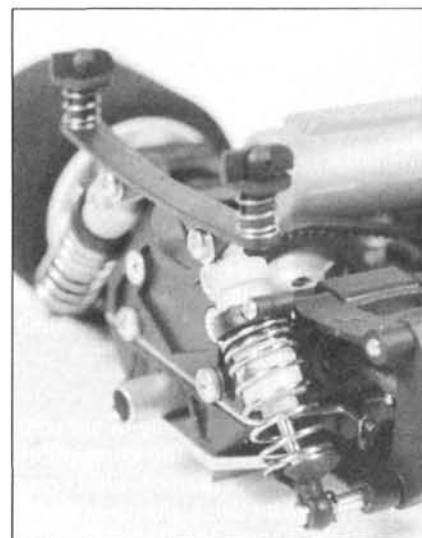
Ride height is somewhat limited by the shock length, but the low-profile wheels keep suspension travel within the travel limits. As with many of the components, the shocks can be updated with the superior Sprint 6020 version. The front lever-arm sway bar is unique to Serpents. It keeps the tires on the ground; for serious high-bite situations, you can add the rear sway bar as well.

The chassis is a sturdy 3mm-thick T6 aluminum pan with countersunk mounting screws throughout. To keep the cen-



The .10 engine ran well, but the car seemed underpowered. A slightly larger engine—a .12 or a .15—would really make this baby move.

Holland (the makers of the legendary Serpent and Quattro) the Impact 10 is a serious $1/10$ -scale gas race car. Berton has more than 10 years of experience in $1/8$ -scale gas racing, which is popular, but has yet to enjoy the huge popularity of $1/10$ -scale electrics. Realizing the potential of $1/10$ -scale gas, Serpent designers bridged the gap between the sophistication and realism of $1/8$ -scale gas and the simplicity of $1/10$ -scale electric on-road.



Plastic oil-filled shocks handle the damping on each corner. Serpent's aluminum shocks also fit the Impact cars.

SPECIFICATIONS

Manufacturer ...Serpent/Berton—Holland
ImporterRC Motorsports of Miami
Type2WD on-road gas
Scale1/10
Sug. retail price\$429.95 (including engine)

DIMENSIONS:

Overall length15.4 inches
Width9.5 inches
Wheelbase10.63 inches
Front track9.17 inches
Rear track9.5 inches

WEIGHT:

Gross (with battery)3 lbs., 8 oz.

BODY:

TypeAndy's Audi Quattro or Nissan GT
MaterialPolycarbonate

CHASSIS:

TypePan
MaterialT6 aluminum

DRIVE TRAIN:

PrimaryPinion/spur/clutch
TransmissionJackshaft/belt
DifferentialNone (straight axle)
Bearings/BushingsDiff bearings

SUSPENSION (F/R):

TypeUpper/lower fixed A-arm/H-arm
DampingOil-filled, coil-over shocks

WHEELS:

Front: TypeOne-piece light nylon
Dimensions (DxW)2.25x1 inches
Rear: TypeOne-piece light nylon
Dimensions (DxW)2.25x1.5 inches

TIRES:

Front/RearFoam

MOTOR:

TypeMagnum .10 cid (2.5cc)
Piston/SleeveAluminum/nickel-plated brass
CarburetorRotating orifice

OPTIONS AS TESTED:

Airtronics CS-2P FM radio; Novak NER-3FM receiver; Serpent ball-bearing set, front sway bar and light rear dogbone set; Bolink Pontiac Grand Am body; Motion Graphics custom paint and graphics.

COMMENTS:

The Impact 10 is a good way to get your feet wet in gas racing. The competition version of the Impact (part no. 8021) may be the way to go for those who insist on the highest performance. The price tag for this fun is hefty, but for the Serpent's uncompromising quality—and all the extras that come with the kit—it may well be worth it.

IMPACT 10

ter of gravity low and to protect all the delicate receiver components, most of the radio equipment (except for the steering servo) is sandwiched between the radio tray and the chassis. The entire design begs to be driven to the limit!

Tuning the Impact's suspension geometry is as easy as changing the up-rights and sliding the A-arms. The rear suspension provides two camber set-



tings: straight up and slightly negative. To increase traction, and because I wasn't sure how potent the Magnum .10 would be, I decided to go with the negative camber setting. On the front, the upper suspension arms slide to adjust caster; all the way forward provided roughly 6 to 9 degrees of caster—perfect for 4WD, but still too much for my taste on a 2WD on-road car. As with most full-suspension cars, ride height and spring rate can be adjusted by altering the shocks and the springs. To keep things simple, I started with the stock setup.

TESTING TIME

Before the first test run, it's important that newcomers to gas-powered R/C cars take a couple of very important precautions:

- Always be sure that the transmitter and receiver batteries are properly charged. A battery dump and consequent loss of control could lead to serious damage or injury to property or people—not to mention the kit.
- Gas engines become very hot and can burn careless or curious fingers. Handle the car with care at all times!
- For the first few tanks of fuel, it's

important to run the engine rich (extra fuel) to break-in the moving parts. I used a fuel mixed with extra castor oil for added protection. Most airplane fuels will work well, but *never* use a fuel with more than 10-percent nitro; it will increase wear and shorten the engine's life.

Getting the car to run is so simple that even novice R/C racers will have no problems. After I had topped off the tank with the small fuel bulb (included), I gave the starter three quick rips, and the engine came to life. When the throttle servo was

set correctly, adjusting the carb was simple. At full throttle, the engine cleared out quickly and hit a crisp high end but remained slightly on the rich side.

On the track, the .10 engine definitely left something to be desired. Top speed was marginal at best, and acceleration was very weak compared with that of the average electric modified. As an entry-level kit in this class, however, it's easy to drive and maintain. The suspension and chassis are built to accept forces much greater than the .10 Magnum is capable of delivering.

For those who want high performance, a competition version of the Impact is available. It includes such features as ball bearings, aluminum oil-filled shocks, a ball differential, steel rear dogbones, and front and rear anti-roll bars. Also, this kit doesn't come with an engine or a body, so the choice is up to the racer.

Side by side with some of the local electric racers, the Impact ran as if it were on rails. The car's full suspension and extra weight allow excellent handling and great response—even with the straight-axle rear end. It may not be

(Continued on page 153)

SCOPING OUT

(Continued from page 114)

troller: the connection diagram in the instruction book is confusing. It shows both a three-wire and a four-wire setup in the same picture. If you aren't familiar with an ESC hookup, this diagram is very hard to follow. Tekin should have separate drawings for the two types of controller.

The other complaint concerns the fact that because the 411G is a three-wire controller, Tekin has left a gaping hole in the case where a fourth wire would exit. This is a little ironic when you consider that Tekin supplies plugs for the adjustment holes.

Both complaints are picky; these problems don't affect performance—and performance is what the 411G is all about. This ESC is well suited to just about any class of car, truck, or buggy that's currently being raced. It's small enough to fit into 1/12-scale pan cars, and it works well with four cells; it's strong enough to handle multiple modified motors used in monster trucks; and it should run cool in just about any application. Even with the heat sink missing, hard runs in my pan car

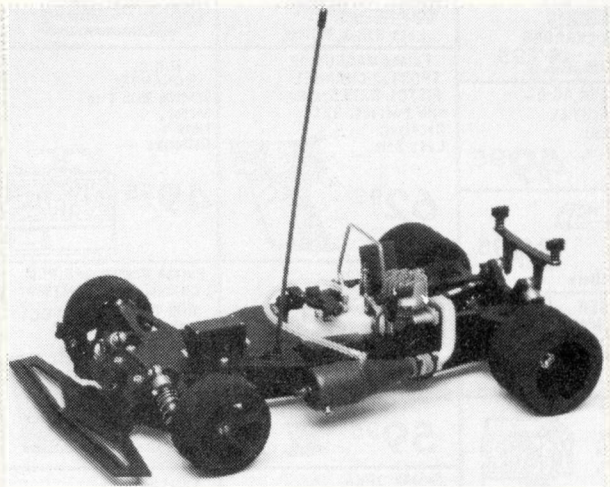
(Continued on page 134)

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SCOPING OUT

(Continued from page 126)

only heated the 411G slightly above room temperature. Install the heat sink, provide plenty of cooling air and overheating will result only from the severest malfunction. The 411G has all the features to make it a world-class champion. I've found a new weapon for next summer's racing program!

**Here are the addresses of the companies that are mentioned in this article:*

Tekin Electronics Inc., 970 Calle Negocio, San Clemente, CA 92672.

Deans Connectors; distributed by Ace R/C, P.O. Box 511C, Higginsville, MO 64037. ■

RON PARIS

(Continued from page 109)

grown. In 1990, business quadrupled from '89, and '89 doubled from '88.

JB: What do you say to people who think that R/C cars are just toys?

RP: My perception of racing is very different from most other people's. This is racing. I don't believe this to be scale modeling; this is racing and it's real. You couldn't get any more real than the cars we use. I built full-scale race engines for many years, including engines for SCCA cars, drag cars, boats and sprint cars, and they're not any different from what we're

doing. It's racing—just a different form. As long as we race, they'll continue to get faster.

JB: I guess you and Ralph Burch hit it off pretty well the first time you met. What's the story behind that deal?

RP: The first time I saw Ralph drive at the McCoy race, I couldn't believe it. He showed up at the race, and somebody had built his car and motor. Before that race, he gave his motor to somebody to check it out. The first day of racing the guy didn't show up, and Ralph didn't have a motor. So, I asked Gene if I could lend them a motor to try out. Ralph Jr. and

(Continued on page 138)

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#7040 RC10T

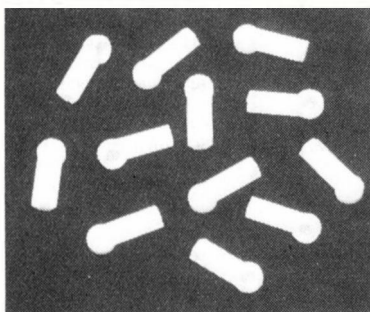
Front Arms are .030 inch longer on each side than the stock arms. They're injection-molded in a tough, dyeable nylon. The RPM aerodynamic, open-rib design won't encourage sand and small rocks to collect between the ribs. Snug fits with good free movement on the hinge pins.



RETAIL: \$11.95/pair

#7338 Heavy-Duty Rod Ends (12) White Losi, Associated (Dyeable)

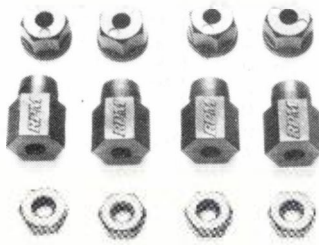
These are the same as our #7337 black rod ends, but they're molded in a white dyeable nylon. They fit well and are much needed on the RC10T!



RETAIL: \$4.95/12

#7328 Losi Top Shock Pivots (4)

RPM now makes a top shock mount that mounts solid to the shock tower. No more stripped threads that allows flex and uneven shock movement! The mount is injection-molded and has a "football" shape that allows good free movement with long-lasting, snug fits.



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RON PARIS

(Continued from page 134)

Ralph Sr. really liked the motor, but the car didn't handle very well. From then on, he didn't use any other motor. Then, he tried my car in Florida once and liked it, so from then on we formed a team, and Ralph, Ralph Sr. and I have become very close. It's a true friendship. Basically, that's it!

JB: Mike Swauger is also one of your strongest drivers. There must be a good story behind his initiation to Team Paris.

RP: It was about four years ago at the ROAR Nationals in Virginia. The weather was about 110 degrees, and I saw Mikie and his dad pitting without a tarp. They were dying out there. I mean his dad looked like he was going to explode; he was as red as a lobster. So they came down and pitted with us, and I said "no problem." The kid drove well, but the car had problems. After the race, I looked at his car, but I really didn't have time to work on it. I already had half a dozen other guys on the team. The next time I saw Mike, darned if he didn't make the A-Main. That was about the last time I drove, and in the Main he put a move on me that made my head spin. Mikie's as good as any driver out there, and he made a commitment to work. The kid's done a lot of growing up. You know, I think Mike's 15 going on 30.

JB: At the IFMAR Worlds, nobody could believe that Ralph pitted twice during qualifiers, and that he was out of the Championship race so early. Here's your chance to tell what really happened.

RP: Two things happened at the Worlds: I made a mistake, and there was a question about IFMAR's approval of my new pipes. My mistake was with the new turbo-head motors. What we found is that the new motors need a spring clutch to get them into the power band and improve fuel economy. Due to the fact that I was the only one who could work on the new spring clutch, Gene and I decided to use the older slipper clutch. That put our fuel economy in the toilet. Second, because of a problem with IFMAR, we couldn't use my new pipe at the race. So to avoid any problem (with EFRA representatives) we just used the older ones. The new pipes would have given Ralph lots more power. In the Main, the only problem we had was with Ralph's receiver crystal.

(Continued on page 140)

AUTOGRAPHICS

of California

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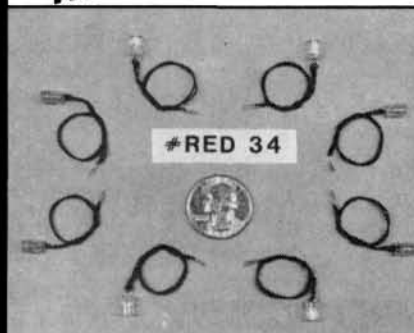
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RON PARIS

(Continued from page 140)

to win a world class event. I don't think you can do that in electric. You can probably spend about the same amount of money to get to the electric or gas nationals, but you just get a bigger return for your money in gas. You get 2 or 3 hours of racing in gas, where you might only get 20 or 30 minutes in electric.

JB: Last question: Where do you see yourself, and where do you see the hobby in five years?

RP: In the future, you'll probably see some electric parts from us. Probably off-road parts. As far as the hobby and gas is concerned, I see myself looking very closely into 1/10-scale gas, and I see 1/10-scale gas as the next wave. But I won't even talk about it until the ROAR rules are established. You can't make the car until the rules are done. Let me tell you what I'd like to do. I'll work on my own, or in conjunction with Associated (and I'm speaking for them, and I probably shouldn't) to develop the most dependable and competitive car possible. ■

IMPACT 10

(Continued from page 120)

as fast as some of the 10Ls and Lynx IIs, but it will turn on a dime and still make change.

As long as I kept up speed in the corners, I held my ground, but down the back straight, the car just couldn't wind out enough rpm. Still, the great sound of its engine makes this racer unlike any other. Like most gas-powered cars, it seemed to pick up once the engine had reached optimum operating temperature. It will be most interesting to see whether

(Continued on page 156)

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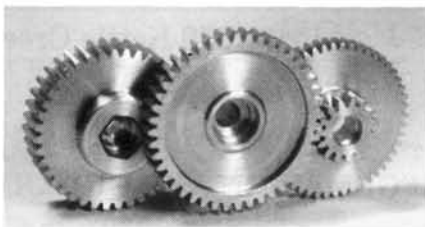
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IMPACT 10

(Continued from page 153)

the Impact can handle the .15 engine's horsepower.

Gas racing is fast becoming a national mania in the U.S., and the Impact 10 represents a bold step into the future. Judging by the reactions of racers at the track, its popularity could someday rival that of electric racing. For now, the Impact is a lot of fun, it's easy to work on, and it's a great way to get your feet wet in gas racing. Because the kit is easy to upgrade, "growing out" of the Impact shouldn't be a problem. If you want to be the first one on your block with something fresh, the Impact 10 is sure to impress your friends, and it really cooks up some great racing possibilities.

**Here are the addresses of the companies mentioned in this article:*

Serpent; distributed by RC Motorsports of Miami, 4715 NW 157th St., Suite 204, Miami, FL 33014.

Magnum; distributed by Global Hobby Distributors, 10725 Ellis Ave., Fountain Valley, CA 92728.

Bolink R/C Cars, 420 Hosea Rd., Lawrenceville, GA 30245.

Motion Graphics, 2645 Robert Arthur Rd., Westminster, MD 21157.

Airtronics, 11 Autry, Irvine, CA 92718.

Novak Electronics, 128-C E. Dyer Rd., Santa Ana, CA 92707. ■

LETTERS

(Continued from page 87)

same thing. When a cornering car's front tires lose their traction before its rears do, it will continue in a straight line and slow down until its fronts regain traction and allow it to turn. The terms "oversteer" and "loose" also mean the same thing, and they're the opposite of understeer. The rear tires break loose before the fronts do, and this causes the rear end to swing out in a direction that's opposite the corner that's being taken. FM

WE INTERRUPT THIS TRANSMISSION

I bought an RC10CE in July, and I'm still assembling it. (I'm working on the transmission now.) In your magazine, I read that other cars often have troubles with their transmissions. Do I needed to use a Stealth tranny to run a modified motor? If there's anything else you think that I might have to change, I'd greatly appreciate the input. Also, what fairly inexpensive hop-up parts are available for my car?

CHRIS NUNEZ
Austin, TX

LETTERS

Here's the story. When it was introduced, the original RC10 transmission (which you have) was absolutely state-of-the-art, but as time passed, the level of technology used to design and manufacture R/C cars progressed beyond it. This is why Associated continually updates the car. Although it's somewhat outdated, the original RC10 tranny is still one of the most durable, and when it's properly assembled, it can pose a threat to even the most advanced transmissions. As for hop-ups, I recommend that you install Jammin' Jay Halsey Racing Products' J-105 RC10 Diff Kit, which will greatly improve the car's differential action. Other than that, leave your car stock, save your money, and work on becoming an expert driver. FM

SHOOTOUTS

You're doing a great job, so keep up the good work! There are a couple of shootouts that dedicated readers (like me) would like to see:

(Continued on page 159)

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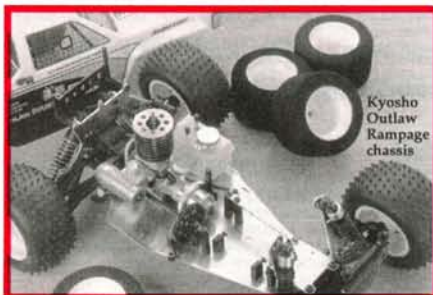
Ever since the category of 1/8 scale gas racing was introduced, there has been a need for high quality, readily available hop-up items. Now DuraTrax is expanding their line to include a special category just for gas racers—in both the 1/8 scale, and even the new 1/10 scale categories. Here's just a sample of what you can find in the DuraTrax Gas Accessory Line:

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Kyosho Inferno chassis shown



Kyosho Outlaw Rampage chassis

Hop-ups now available for 1/10 scale gas racers, too

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Look for these and other gas hop-ups from DuraTrax when you visit your local hobby shop.

For more information, write for product packet no. 862.

LETTERS

(Continued from page 157)

- the Clod Buster and the Bull Head versus the USA-1;
- the Burns DX or Turbo Burns versus the Pirate M-1;
- the JR-XT versus the Traxxas Blue Eagle;
- the Blue Eagle versus the RC10T and/or the King Cab or the Hi-Lux;
- a "Monster Truck Shootout," Part 2.

Why doesn't *Car Action* sponsor its own racing team (hint, hint). With knowledgeable drivers like Steve Pond and Chris Chianelli, this team would be threatening!

Can gas-powered cars, e.g., the Corvette ZR-1, the Nitro Brute, the Turbo Burns, or the Pirate, sit and idle? Can I check my car while it's running, or do I have to shut off the engine?

MARSHALL JENNINGS
Brooklyn, NY

So, you want to see some shootouts, eh? We have some in the works but, for now, the details are extremely confidential! We wish we could start a Car Action racing team; we have the know-how and the equipment, but time is a problem! I'm not

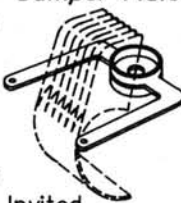
(Continued on page 160)

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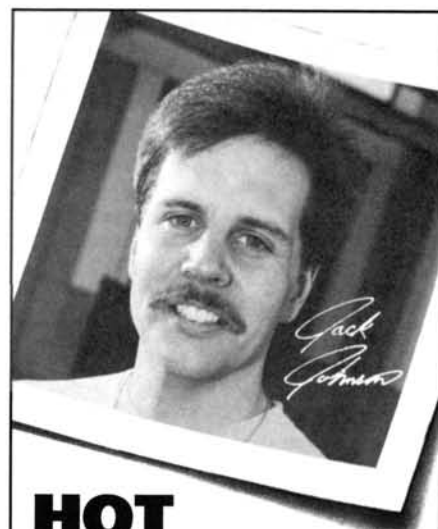
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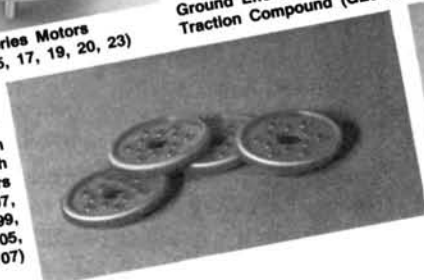
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Moly/Graph Lubricant



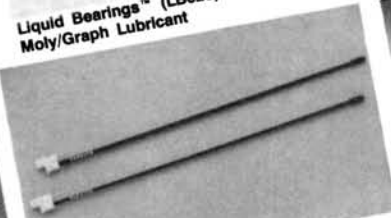
Gear Caddy™ (GC020)



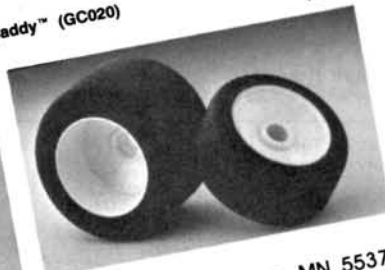
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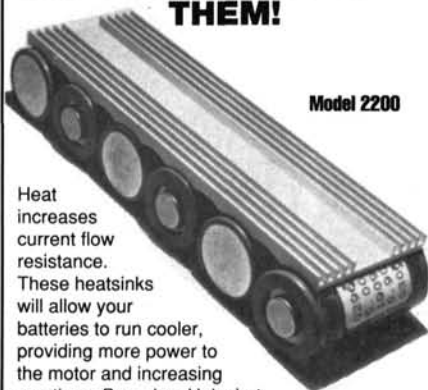


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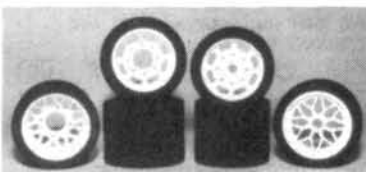


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LETTERS

(Continued from page 159)

sure that I'd want to race with Chris, anyway. The last time he raced, he wound up heading in the opposite direction of all the other cars!

The centrifugal clutch enables you to let your gas car sit and idle. When the engine reaches a given rpm (above idle), the clutch begins to deliver power to the tranny. When you apply the brakes, the engine is throttled down at the same time, and this disengages the clutch. JH

DIFF FIX

I'm a rookie, and I have a couple of questions about my Traxxas 1/12-scale Fiero GTP chassis. (I use a Novak 410-M1c speed controller, a Trinity Slot Machine motor and a few other goodies that I borrowed from other cars.) Are there any gear-differential hop-ups? I like to support the underdog, so I intend to stay with this chassis instead of using the more accepted Associated 12L. In fact, I sent those 12L drivers into fits at my last race. (Unfortunately, a lapped car tapped into the guardrail and popped the two front body clips through my car's Lexan body, causing the front end to act like an airfoil. I had to get off the throttle, so I ended up in 3rd place. Still, many of my fellow racers commented on how smooth I had made the gears on the diff.) If there aren't any gear diff hop-ups, can I install a ball diff? I realize that this would entail altering the motor mount and the surrounding area, and that's why I hope there are hop-ups. Thanks for your time and advice.

GABE JOHNSON
Anniston, AL

Gabe, I'm not surprised that you did well with your car; it's not a piece of junk. It will take a little work to add a ball diff, but it's feasible. I suggest that you buy an axle for the 12L and make it fit. The bearings in the Traxxas car are metric, but the Associated axle is standard, so you'll need adapters. Try the ones offered by Dan's RC Stuff (9525C Cozycroft Ave., Chatsworth, CA 91311). JH

LOOKING FOR UGLY

In the November '91 issue, you did an article on the '91 TRC/Trinity ROAR Paved Oval Nationals in Winston-Salem, NC. You mentioned that a lot of racers used the Ugly Axle setup, and I'm interested in trying it in my Bolink LTO. Can

(Continued on page 162)

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LETTERS

(Continued from page 160)

you please tell me how to obtain one? I asked the people at my local hobby shop, but they didn't know. Thanks for any info you can provide.

ROBERT CHILDERS
Knoxville, TN

The Ugly Axle is offered by Team Arlington, 218 N. Dunton, Arlington Heights, IL 60005; (708) 255-7383; Fax (708) 255-7387.

JH

MR. MONEYBAGS

I loved the "Primadonna Clod" article! This winter, I'm building the greatest Clod Buster that anyone has ever seen (well, in my area, anyway). It will include Boca Ultra bearings, a Sassy chassis, JPS aluminum gearboxes, a Stormer 4:1 gear-reduction unit, JPS steel gears and JPS rims (do you get my point yet?). I'd like to use titanium turnbuckles for it, but I can't find a company that makes them. Do you

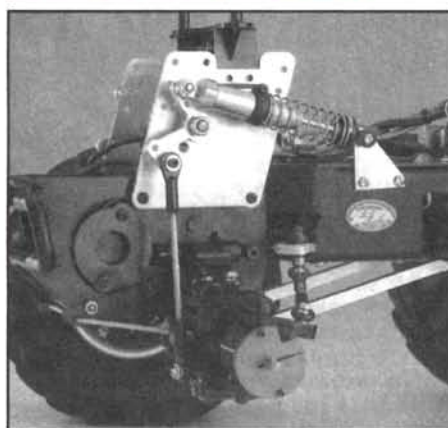
(Continued on page 164)



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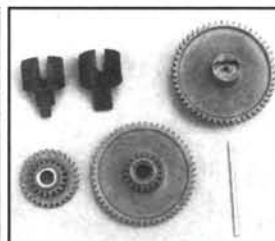
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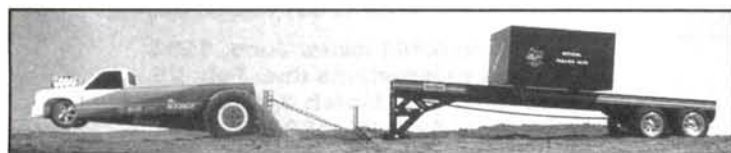


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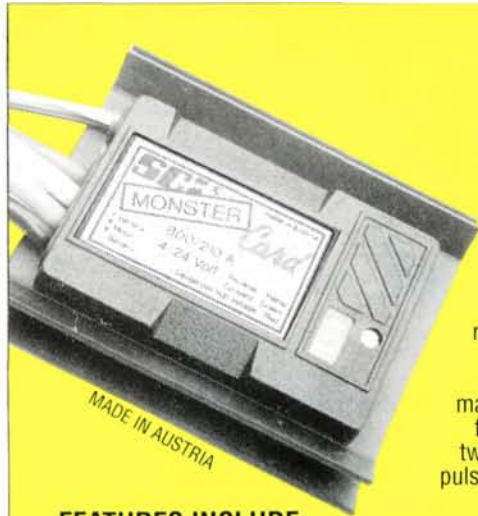
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TIME

LETTERS

(Continued from page 162)

know of one? Look for my truck in "Readers' Rides," and don't change a thing about your mag!

BRIAN FEINSTEIN
Eau Claire, WI

Brian, we get the point; you have too much money to play with. Why don't you send some of it to me? Just kidding. Check out Tecnacraft's 6-40 titanium turnbuckles (the standard, 4-40 ones would be too thin). They don't have quite the same diameter or length as the metric ones that came with the kit, but they're close enough for you to use them in at least a couple of places.

JH

POSSESSED?

I have an RC10 with the receiver and speed controller both mounted on the chassis. When I run it, after about 50 feet, it starts to act on its own. I can gain control of it by fighting the steering or pulling the brake, but how can I solve the problem? The antenna wrapper touches the chassis.

Also, how do you adjust the Stealth tranny? I read the manual, but when I tighten the diff, it grinds a little, and then I loosen it quickly until it slides smoothly. Is this OK?

JEFF HENSPETER
La Verne, CA

Jeff, it's hard for me to diagnose the problem without seeing your car, but I'll try. The antenna wire shouldn't touch the chassis, and you should route it as far away from the power wires as possible. Also, try mounting the receiver or the ESC on the shock tower. If you still have problems, try a receiver pack or, as a last resort, have the radio checked out by a professional repairman.

Adjusting the Stealth is simple. Check that the parts are totally clean, and replace or flip the diff and thrust rings if they show signs of wear. Lube and reassemble the diff according to the instructions. When you tighten the adjustment screw, be careful and work slowly. When you feel the spring bottom out, stop tightening and turn the screw about a quarter turn counterclockwise. The diff should operate smoothly, and it should still be tight enough not to slip.

JH

LIKE, WOW...

Like—wow, man. Are there are, like, any companies that do custom decals? Ya

(Continued on page 176)

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Desert R/C Raceway, 39360 3rd St. E., Suite 305, Palmdale, CA 93550; (805) 272-1835



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Robin's Racing World, 1844 W. Glenoaks, Glendale, CA 91201; (818) 240-2093



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San Diego R/C Car Club, P.O. Box 232456, San Diego, CA 92193; (619) 560-0089



SRS Raceway, 915 N. Main St., Salinas, CA 93906; (408) 424-4044



Trains, Planes, Automobiles, 1260 Oddstad, Redwood City, CA 94062; (415) 365-7500



Tyler's RC/RD Racing Center, 6865 Flanders #D, San Diego, CA 92121; (619) 597-3072



Woodbridge R/C Speedway, Irvine, CA. Contact Dave Anderson, (714) 551-5007



Yorba Linda R/C Speedway, 3780 Prospect #B, Yorba Linda, CA 92686; David Landier, (714) 572-2175



COLORADO

Action R/C Raceway, 4939 N. Broadway #57, Boulder, CO 80304; (303) 440-0330



Colorado R/C Speedway, 6520 Wadsworth Blvd. #130, Arvada, CO 80003; (303) 425-1718



Edora Park R/C Speedway, Edora Park, Ft. Collins, CO 80524; (303) 482-0197



Hot Lap Hobbies & Raceway, 4206 Wadsworth, Wheat Ridge, CO 80034; Phil Cotter, (302) 420-3051



MHOR R/C Raceway, 15540 E. Batavia Dr., Aurora, CO 80011; (303) 343-0151



R/C World & Track, 2788 S. Federal Blvd., Denver, CO 80236; (303) 789-0838



CONNECTICUT

Connecticut R/C Off-Roads, Old Field School, Mona Terrace, Fairfield, CT 06430; (203) 661-0145



High-Tech Raceway, 374 Enfield St., Enfield, CT 06082; (203) 745-8488



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

Hobby World Raceways, 161-6 Woodford Ave., Plainville, CT 06062; (203) 793-1111



K/N R/C Speedway Inc., West St., Stafford Springs, CT 06076; (203) 684-9896



R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (203) 741-6501



R/C Raceways Inc., 1265 John Fitch Blvd., South Windsor, CT 06074; (203) 528-3661



R/C World/Sugar Hollow Speedway, 66 Sugar Hollow Rd., Danbury, CT 06810; (203) 748-2185



SCORA/Clayton's Off-Road Racing, 141A Middletown Ave., North Haven, CT 06473; Craig or Keith, (203) 234-CLAY



Wallingford Indoor Racing, 63 N. Cherry St., Wallingford, CT 06492; (203) 265-3939



DELAWARE

NT Raceway, Alt 13 South, Seaford, DE 19973; (302) 628-0520



FLORIDA

i-fifty-5 Raceway, County Rd. 555, Bartow, FL 33830; (813) 324-7406 (Chuck Nolke)



I-T R/C Central, 811 Playground Rd., Fort Valton Beach, FL 32547; (904) 863-2666



ranford R/C Speedway, Rt. 3, Box 240, ranford, FL 32008; (904) 935-0758



ontinental Racing, 5335 N. Military Trail, West Palm Beach, FL 33407; (409) 697-167



oral Springs Roadrunners, P.O. Box 632, Coral Springs, FL 33075; Tom Ilison, (305) 721-0344 or Rick Schwartz, (305) 344-1983



Ft. Lauderdale Speedway, Mills Pond Park, 2201 NW 9th Ave., Ft. Lauderdale, FL 33311; Jack Koons, (305) 424-6617



Greater Orlando Auto Racers, 960 Keller Rd., Altamonte Springs, FL 32779; Dave Mottin, (407) 293-7090



H&H Raceway, 4121 S. Tamiami Tr., Sarasota, FL 34231; (813) 922-7711



Hialeah Hobby Raceway, 4562 W. 12 Ave., Hialeah, FL 33015; (305) 826-3702



JARCAR/Hobby World, 7273 103rd St., Jacksonville, FL 32210; (904) 772-9022



Lake Whipoorwill International Speedway, 12345 Narcoossee Rd., Orlando, FL 32827; Bob Hosh, (407) 277-9586; fax (904) 759-3993



Lou's R/C Hobbies & Raceway, 1512 SE Village Green Dr., Port St. Lucie, FL 34952; (407) 337-9000



M&M R/C Raceway, 16921 Waterline Rd., Bradenton, FL 34202; Mike Williams, (813) 747-2889



PBG R/C Motor Park, 4399 Lilac St., Palm Beach Gardens, FL 33410; (407) 624-9252



Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615



Raceway Hobbies, 1115-J Enterprise Court, Holly Hill, FL 32117; (904) 258-7537



Ray's Track & Hobby, 4605 W. Cayuga St., Tampa, FL 33614; (813) 872-8662



Rental Raceway, 3655 S. Hopkins Ave., Titusville, FL 32780; (407) 383-0631



St. Augustine R/C Speedway, 99 Masters Dr., St. Augustine, FL 32095; (904) 824-6357



Space Coast Raceway, 563 Barton Blvd., #17, Rockledge, FL 32955; Bill Pinch, (405) 631-4373



Sun Valley Speedway, Palmer Blvd., Sarasota, FL 34232; (813) 322-1200; (mailing address: Rt. 1, Box 443N, Myakka City, FL 34251)



West Coast R/C Club, Lake Park, 8607 May Cr., Tampa, FL 33614; (813) 932-3650



Wilbur Avenue Raceway, 1848 Wilbur Ave., Vero Beach, FL 32960; (407) 567-1200



GEORGIA

Case R/C Raceway, P.O. Box 1061, Trenton, GA 30752; (404) 657-6789



Dalton Raceway, 2300 Chattanooga Rd., Dalton, GA 30720; (404) 226-6699



Georgia Hobby Center, 112 Kenwood Rd., Fayetteville, GA 30214; (404) 460-1753



Good Life City Raceway, 6606 Newton Rd., Albany, GA 31707; (912) 888-2515



Lake Mayer Raceway, 1 Melinda Circle, Savannah, GA 31460; Phil Hurd, (912) 355-6033



Peach Bowl R/C Speedway, 2035 Westside Ct., Snellville, GA 30278; (404) 985-1448



The Racer's Edge, 1530 Hwy. 19 North, Thomaston, GA 30286; Mark or Roger Walls, (404) 648-6534



Sandy Cross Speedway, Rt. 1, Box 1073, Royston, GA 30662; Morris Phillips or Wayne Fowler, (404) 245-9573



Silver Wings Raceway, 5611 Riverdale Rd., College Park, GA 30349; (404) 991-2225



IDAHO

Falls Hobbies & R/C Raceway, 1515 Northgate Mile, Idaho Falls, ID 83401; (208) 529-8650



ILLINOIS

Ameri-Trac, R3, Box 242, Mattoon, IL 61938; (217) 234-8707



Badlands II, 320 W. Jackson St., Vandalia, IL 62471; (618) 283-2913



B.A.R.R., 809 River Dr., Byron, IL 61010; Jim Haynes, (815) 234-5615



Eagle Speedway, 303 N. Plum St., Pontiac, IL 61764; (815) 842-1738



Ebbtide Hobbies & Raceway, 865 N. Main St., Antioch, IL 60002; Jim Schaefer, (708) 395-8433



Hobby Town Raceway, 4915 W. Rt. 120, McHenry, IL 60050; Mike Hollingsworth, (815) 344-1777



JC Hobbies/Metro Motor Speedway, Metropolis Airport, Metropolis, IL 62960; (618) 524-9979



JMP Raceway, 952 Harrison Ave., Wood River, IL 62095; (618) 258-0297 or -0282



Leisure Hours Hobbies, 2872 Plainfield Rd., Joliet, IL 60435; (815) 439-1477



Lisle Community Park Raceway, 1825 Short St., Lisle, IL 60532; (708) 416-6944 (Jim Bernicky)



Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61111; (815) 282-1311



Magnum R/C Speedway, RR#2, Box 399, Danville, IL 61832; Terry & Nancy Dines, (217) 446-2472



Midwest Hobby Trax R/C Raceway, 114 Kirkland Circle, Unit A, Aswego, IL 60534; Duane Pierson or John Koonce, (708) 978-RACE



Monee R/C Raceway, 26049 Ridgeland Ave., Monee, IL 60449; (708) 534-2422



R/C Speed Zone, 1400 E. Lafayette, Bloomington, IL 61701; (309) 662-RACE



Redline Raceway, 921 Harding, Calumet City, IL 60409; (708) 862-8181



SIRCAR Raceway, 1200 North Marion, Carbondale, IL 62901; (618) 549-5885



Slot Wing Hobbies Race Place, 1615 W. Springfield, Champaign, IL 61821; (217) 359-1920



Smithton Community Park, P.O. Box 8152, Belleville, IL 62221; (618) 236-7569



Superior Raceway, 1706 W. Bradley, Champaign, IL 61821; (217) 359-8073



Thunderroad Speedway, 5 W. Division St., Coal City, IL 60416; A. Cooley, (815) 634-8184



Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; (815) 332-4516



INDIANA

BJ's Riverside Raceway, 265 S. Clay St., Jasper, IN 47546; Joe Lorey, (812) 482-3484



Blaze'n Race'n, P.O. Box 6, Hamlet, IN 46532; James Berndt, (219) 867-1324



Boone County R/C Track, 1300 E. 100 S. Rd., Lebanon, IN 46052; Jerri Moss, (317) 293-2225



CC Hobby & Speedway, RR 1, Box 68, Francesville, IN 47946; (219) 567-2447



County Line R/C, 2333 West State Road 38, Sheridan, IN 46069; Greg Welch, (317) 758-6393



Gonzo Raceway, 418 Roberts Rd., Chesterton, IN 46304; (219) 980-8409



Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773



K&L Hobbies, 7 Raceway, 2751 N. State Rd. 39, La Porte, IN 46350; (219) 324-0353



Master Hobbies, 8501 Bash Rd., Indianapolis, IN 46250; Tim or Dan, (317) 576-1961



Mooresville R/C Hobby, 7 Moore St., Mooresville, IN 46158; (317) 831-8877



Mooresville R/C Hobby, 9201 S. State Rd. 67, Camby, IN 46113; (317) 831-8877



PITT, 1244E 700N, Ossian, IN 46777; (219) 622-4591



R/C World of Indiana, RR #2, Box 335, Lynn, IN 47355; (317) 874-2464



Radio Car Craft, 1925 S. Curry Pike, Bloomington, IN 47403; (812) 332-3245



IOWA

Kodiak Race Track, Box 78, Okoboji, IA 51355, Brad or Dave, (712) 332-7982



Mr. Car Raceway, Central Iowa Fairgrounds, Marshalltown, IA 50158; (515) 483-2234



North Park R/C Speedway, 805 S. Jerome, Algona, IA 50511; (515) 295-9352



Plymouth County R/C Speedway, 4th Ave. NE (Plymouth County Fairgrounds), LeMars, IA 51031; (712) 546-8788 or 546-9522



Power House Racing, 1200 S. Division St., Creston, IA 50801; (515) 782-4582 or 782-4174



Rotunda Raceway, 101 Bass, RR 1 Box 155A, Storm Lake, IA 50588; (712) 732-4555



Sibley Raceway, Osceola County Fairgrounds, Sibley, IA 51249; Al Reck (712) 754-2604 (day) or 754-3613 (night)



Southwest Iowa R/C Raceway, Kelly Park, Red Oak, IA 51566; (712) 623-5513



Southwest Iowa R/C Raceway, Montgomery County Fairgrounds, Red Oak, IA 51566; (712) 623-5513



Team Johnson Speedway, Jct. Hwy. 34 & 406, West Burlington, IA 52655; (319) 753-0753



KANSAS

Chad's R/C World & Raceway, 217 Brownie Ave., P.O. Box 76, Scranton, KS 66537; (913) 793-2313



Pittsburg International Mini Speedway, 511 1/2 N. Locust, Pittsburg, KS 66762; (316) 232-1973



R/C Superdome & TQ Pro Shop, 14 East Avenue A, Hutchinson, KS 67501; (316) 665-6633



Spring Creek Raceway, 7257 W. Cloud St., Salina, KS 67401; (913) 823-8992



KENTUCKY

Bluegrass Int'l/Perry's R/C Hobbies, 214 Globe St., Radcliff, KY 40160; William Perry, (502) 351-RACE



Fast Lane Hobbies, 6132 Scottsville Rd., Bowling Green, KY 42104; (502) 782-2419



Hobbys Plus, 819 Main St., Hazard, KY 41701; Joe Mavaro, (606) 436-3175



The Lexington Autodrome Raceway, 2753 Richmond Rd., Lexington, KY 40509; (606) 269-7794



Remote-Control Hobby Shop/Raceways, Rt. 8, Box 211, Mayfield, KY 42066; (502) 247-4715



River Cities Raceworld, 1104 Powell Lane, Flatwoods, KY 41139; (606) 836-CARS



LOUISIANA

Acadiana R/C Hobbies & Raceway, 120 Toledo Dr., Lafayette, LA 70506; (318) 235-5825



Cajun R/C Raceway, Rt. 2, Box 288 Hwy. 343, Church Point, LA 70525; (318) 873-3855



The Hobby Shop Track, 110A Darbonne, Sulphur, LA 70663; (318) 527-9129



Oakdale Raceway, 1259 Hwy. 165 S., Oakdale, LA 71463; M.L. Jeziorski, (318) 335-3532



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

MAINE

Central Maine R/C Speedway, 18 Lithgow St., Winslow, ME, 04901; David Prescott, (207) 877-2232



Rocket R/C Hobbies, Annabessacook Rd., Winthrop, ME 04364; (207) 377-6910



Team Terminator Off-Road Track, c/o Hobbies Plus, 479C Elm St., Biddeford, ME 04005; (207) 282-8838



The Racers' Club, 85 Hubbard Rd., P.O. Box 160, Berwick, ME 03901; (207) 698-5337



MARYLAND

ABC Raceway, 2825 Ocean Gateway, Cambridge, MD 21613; (301) 228-4291



Cliff's R/C Raceway, 4727 Conowingo Rd., Darlington, MD 21034; Doug, (301) 538-3135



Doug's Hobby Shop Raceway, Rt. 301N, Box 32B, Waldorf, MD 20601; (301) 843-7774



Friendship Off-Road Racers, 1531 Florida Ave., Severn, MD 21144; (301) 551-3050



GPA Speedway, 3498 Crain Hwy., Bowie, MD 20715; George Cole, (301) 805-9004



Off-Road Headquarters Indoor Raceway, 5640 K Sunnyside Ave., Beltsville, MD 20705; (301) 474-1246



Suzie Goose Hobbies, 718 E. Gude Dr., Rockville, MD 20850; (301) 279-2966



MASSACHUSETTS

Archer's Lane R/C Raceway, 11B Washington St. (Rt. 1), S. Attleboro, MA 02730; (508) 399-6762



CKS Raceway, 46 Wilbraham St., Palmer, MA 01069; (413) 283-2260



Megadrome Raceway, North Adams Plaza, Rt. 8, North Adams, MA 01247; (413) 743-7223



Mike's Speedway, Rt. 9, Mt. Farms Mall, Hadley, MA 01035



Naytrix Raceway, Holmes Rd., Pittsfield, MA 01201; Rick Welch or Nate Zuckerman (413) 443-2488 or 443-9886



R/C Hobbies & Speedway, 1311 Purchase St., New Bedford, MA 02740; (508) 991-5040



West St. Hobbies, 114C Main St., Medway, MA 02053; (508) 533-1231



MICHIGAN

Baja Bayou Off-Road Raceway, 5313 West 22 Mile Rd., Tustin, MI 49688; (616) 829-3447



Can-Am Hobbies Speedway Park, 1148 Gratiot, Marysville, MI 48040; (313) 364-3338



Cereal City R/C Off-Roaders, 2000 E. Columbia Ave., Battle Creek, MI 49015; (616) 963-2506



Fun Tyme High Banked Oval, Fun Tyme Adventure Park, 6295 E. Saginaw Hwy, Grand Ledge, MI 48837; (517) 655-5503



Jonimo Hobby & Raceway, 27788 Joy Rd., Livonia, MI; (313) 422-1830



Ludington R/C Raceway, 1483 N. Dennis Rd., Ludington, MI 49431; (616) 843-4654



Mason County R/C Car Track, West Shore Community College, (611 N. Washington Ave., Ludington, MI 49431) Scottsville, MI 49454; (616) 843-8553 or 843-4837



More R/C Club, 33538 23 Mile Rd., Chesterfield Township, MI 48047; (313) 773-5918 (Tom Kelly) or 749-9774 (Joe)



Off-Road Speedway, 1940 Lakeville Rd., #28, Oxford, MI 48371; (313) 628-4320



Pointe R/C, 2119 Summerton Rd., Mt. Pleasant, MI 48858; Frank, (517) 773-5711



R&L Hobbies, 10334 Portage Rd., Portage, MI 49002; (616) 323-3686



R.G. Enterprises, 600 N. Lafayette, Greenville, MI 48838; (616) 754-4919



Rider's Superspeedway, 42040 Koppernick, Suite 400, Canton, MI 48187; Brent Martin, (313) 451-5599



Rider's Superspeedway, 4415 S. Westledge, Kalamazoo, MI 49008; Ken Penn (616) 349-2666



USA Raceways, 6083 Dixie Hwy., Bridgeport, MI 48722; (517) 777-7USA



MINNESOTA

Wild West R/C Speedway, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 722-6248



Minn-E-Golf & Hobby, 9100 Park Ave., Elk River, MN 55330; (612) 441-8365



MISSISSIPPI

Norm's R/C Hobbies, 310 E. Beach Blvd., Long Beach, MS 39560; (601) 863-0524



Precision Hobbies, 240 Eisenhower Dr., Biloxi, MS 39531; (601) 388-6346



Small Cars Unlimited, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST



MISSOURI

Doug's Hobbies, 5221 Veil of Tears, Jefferson City, MO 65109; (314) 893-5861



Gateway R/C Track & Hobbies, 255 Marshal Rd., P.O. Box 345, Valley Park, MO 63088; (314) 255-5844



Harrisonville Hobby Shop & Raceway, 2301 S. Commercial, Harrisonville, MO 64701; Richard Taylor, (816) 887-3055



Lafayette Riverside Raceway, P.O. Box 9663, Marshall Rd., Kirkwood, MO 63122; Don Laningham, (314) 966-8912



Outback Speedway & Hobby, 2810 Sutton Blvd., Maplewood, MO 63143; (314) 644-3383



R + Hobby, 590 Jungermann Rd., St. Peters, MO 63376; (314) 928-9838



MONTANA

Bozeman R/C Powerhouse Track, west side of the Main Mall, Bozeman, MT 59715; (406) 586-6461



Garden City Raceway, 6725 Hwy. 10 West, Missoula, MT 59802; (406) 721-5405



Magic City R/C Raceway, 14th St. W. & Central Ave., Billings, MT 59101; (406) 259-9004



NEBRASKA

The Salvation Army, 4032 Harrison St., Omaha, NE 68147-1012; Lt. Michael Delashmit, (402) 634-3414



NEVADA

Little City Hobbies Raceway, 640 Kuenzki, Reno, NV 89503; Gregg Allen, (702) 786-3611



NEW HAMPSHIRE

4-K Racing, 100 Warwick Rd, Winchester, NH 03470; (603) 239-6207



C.T. Hobbies R/C Raceway, 49 Eaton Rd., Auburn, NH 03032; (603) 483-2274



Hobbies Plus R/C Raceway, 14 Celina Ave., Nashua, NH 03063; (603) 882-9200



Hobby Etc., Heritage Place, Rt. 101A, Amherst, NH 03031; (603) 595-8549



R&B Racing, Lily Pond Rd., Gilford, NH 03246; Louie, (603) 524-2909 or Bud (603) 524-1893



NEW JERSEY

Action Raceway & Hobby Center, Rt. 295 & Harmony Rd., Gibbstown, NJ 08027; (609) 423-8933



Glassboro's Grand Oval Speedway, 167 S. Delsea Dr., Glassboro, NJ 08028; (609) 863-1551



Hopewell R/C Speedway, 138 West Broad St., Hopewell, NJ 08525; (609) 466-2715



Jackson R/C Racing, Marshall Ave., Jackson, NJ 08527; (908) 905-1593



L.B.R.A. Track, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122



The Race Place, Rt. 33 & 34, Farmingdale, NJ 07727; (908) 938-5215



Radical Raceway & Hobbies, 100 Rt. 17S, Lodi, NJ 07644; (201) 843-6996



Tri-Oval Speedway & R/C Center, 296 S. Main St., Phillipsburg, NJ 08865; (908) 454-2223



Truck Challenge, 1162 Rt. 202-206N., Bridgewater, NJ 08807; Michael Gill, (908) 658-9616



Zeppelin Hobbies, 92 Rt. 23N, Riverdale, NJ 07457; Lou Ballini, (201) 831-7717



NEW MEXICO

The Pit/Las Cruces Hobby Raceway, 1996 A S. Valley Dr., Las Cruces, NM 88001; (505) 524-8530



Racers Inn, 4300 Rankin Ln. NE, Albuquerque, NM 87107; (505) 345-5988



NEW YORK

A&D's FasTracks, 1000 N. Main St., Brewster, NY 10509; (914) 279-2065



A&S Race Center & Hobbies, 120 Cayuga St., Canalview Mall, Fulton, NY 13069; (315) 598-2772



Bellmore Raceway, 2479 Charles Ct., Bellmore, NY 11710; (516) 783-3456 or 783-0105



Brockport Speedway, 6000 Sweden Walker Rd., Brockport, NY 14420; Gil & Betty Glidden, (716) 637-6224



Cars R/C & Guitars, 4360 Seneca St., West Seneca, NY 14224; (716) 674-0905



Central New York R/C Auto Racers, Martin St., P.O. Box 116, Rome, NY 13440; John Orr, (315) 336-5140



Chipmunk Hill R/C Speedway, 217 Pine St., Theresa, NY 13691; Ted House, (315) 628-5065



Dirt Track, 17 Fairway Dr., Manorville, NY 11949; Billy Wroblewski (516) 878-0737



East End Off-Roaders, Route 25A at Gull's Square, Wading River, NY 11792; (516) 929-8844



Eliminator Raceway, 125 Vermont Ave., North Babylon, NY 11703; Jim, (516) 321-6730



Island Hobbies & Raceway, 410 Commack Rd., Deer Park, NY 11729; (516) 254-6229



Lakeside Raceway & Hobbies, 712 Willow Ave., Ithaca, NY 14850; (607) 272-0248



Latest Hobbies & Raceway, Rt. 25A, Wading River, NY 11792; (516) 929-8844



LI 1/4-Scale Racers, 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384



Maspeth Raceway, Rust St. & 57th Rd., Maspeth, NY 11378; (718) 894-0800



Norwood Hobbies Raceway, 2-4 S. Main St., Norwood, NY 13668; Tom Jarvis, (315) 353-6621



Queens Off-Roaders, 42-12 13th St., Long Island City, NY 11101; (718) 392-5766



R/C Competition Corner, K-Mart Plaza, Mattydale, NY 13211; (315) 455-8718



R/C Hobbies, Rt. 49, Box 138, Constantia, NY 13044; (315) 623-9536



R/C Speedway & Hobbies, 1555 State St., Watertown, NY 13601; Steve Pena, (315) 788-1320



Riverside R/C & Hobby, P.O. Box 125, Rt. 126, Beaver Falls, NY 13305; (315) 346-1682



Russet's R/C Racetrack, 1793 Ridge Rd., Ontario, NY 14519; (315) 524-2522



Schenectady R/C Speedway, 955 State St., Schenectady, NY 12307; (518) 370-3747



Schoharie Co. R/C Car Club, P.O. Box 126, Cobleskill, NY 12043; (518) 234-4600



Skaneateles Raceway & Hobby, P.O. Box 102, Rt. 20, W. Genesee St., Skaneateles, NY 13152; (315) 685-8077



South Shore Hobby & Raceway, 311 W. Roe Blvd., Patchogue, NY 11772; Don Hauck, (516) 758-5567



Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291



Western New York R/C Speedway, 58 Spring St., Cuba, NY 14727; Jason Congdon, (716) 968-3586



NORTH CAROLINA

C&H Raceway, 1400 N. Cannon Blvd., Kannapolis, NC 28081; (714) 933-5321



Cape Fear Speedway, 107 Harley Rd., Wilmington, NC 28401; (919) 762-1184



Carolina R/C Drag Assoc., 907-C Warsaw Rd., Clinton, NC 28328; (919) 592-9489



Charlotte R/C Raceway & Hobbies, 5820 Old Concord Rd., Charlotte, NC 28213; (704) 597-0608



Clinton R/C Raceway, 907-C Warsaw Rd., Clinton, NC 28328; Corbitt Marshburn (919) 592-9489



Granite City R/C Raceway, 192-1 N. Main St., Mt. Airy, NC 27030; (919) 786-1466



Hi-Performance Hobbies & R/C Raceway, P.O. Box 320, Earl, NC 28038; Derrell Hollifield, Steve Bliss, (704) 482-4391



Hobby Park, 464 Knollwood St., Winston-Salem, NC 27103; (919) 768-2345



Jacksonville International Speedway, Hwy. 17N, Jacksonville, NC 28540; (919) 346-1522



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

Joe's Hobby Shop & Raceway, Rt. 2, Box 682-B, Bessemer City, NC 28016; (704) 435-2912



Mountain R/C Raceway, Hwy. 107N, P.O. Box 67, Glenville, NC 28736; (704) 743-3709



Reedy Creek Raceway, Rt. 14, Box 946, Conard Sowers Rd., Lexington, NC 27292; (704) 731-4022



Sandhills Raceway, Inc., US #1 South, Aberdeen, NC 28315; (919) 944-7414



Smiley Face Raceway, 120 W. Center St., Mebane, NC 27302; (919) 563-3822



TLC R/C Raceway, Rt. 6, Box 321-A, Hwy. 601, Mocksville, NC 27028; (704) 492-7569



NORTH DAKOTA

Crystal Springs Off-Road, 1200 53 Ave. SW, Minot, ND 58701; (701) 852-9590



OHIO

Alcraft's R/C Raceway, 1370 Custer-Orangeville Rd., Brookfield, OH 44003; (216) 448-1573



Classic Hobbies & Raceway, 2845 W. Waterloo Rd., Akron, OH 44312; (216) 628-3222



Hi-Tech Hobbies II, 116 Taylor St., Loveland, OH 45140; Rick Lewis, (513) 683-8900



Hobby Mania Raceway, 6597 Route 224, Lovellville, OH 44436; (216) 536-8282



Innovative Hobbies/Lakeside Speedway, 3427 Manchester Rd., Akron, OH 44319; (216) 645-1333



KAR R/C Raceway, 14511 Seacrest Rd., Salem, OH 44460; (216) 537-4039



Mid-Ohio R/C Raceway, 5367 Fishburg Rd., Huber Heights, OH 45424; (513) 233-2807



Way Out Hobbies, 5583 Centerpoint Rd., Georgetown, OH 45121; (513) 375-4984



Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025



OKLAHOMA

Off-Road R/C Autos of Tulsa, 13349 E. 11th #B, Tulsa, OK; (918) 251-5592



OKC Raceway, 6707 NW 10th, Oklahoma City, OK; (405) 495-4820



RCRC of Oklahoma, 400 S. Vermont, Suite 104, Oklahoma City, OK 73108; Robert Jones, (405) 942-RCRC



OREGON

Buggy Boogie Race Track, Rt. 4, Box 546, Astoria/Knapka, OR 97103; (503) 458-5357



Ed's Dirt Speedway, 2809 N. Cherry St., La Grande, OR 97850; (503) 568-4332



R/C Plus Hobbies Raceway, 2029 25th St. SE, Salem, OR 97302; (503) 364-9188



R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501; (503) 779-8298



Thunder Road, R/C Hobbies, 1624 Williams Hwy., Grants Pass, OR 97527; (503) 479-8701



PENNSYLVANIA

Brian's Raceway, 733 Flexer Ave., Allentown, PA 18103; (215) 435-1862



Clearfield R/C Car Club, P.O. Box 297, Clark Hill Rd., Hyde, PA 16843; Joe Welch (814) 765-3045



Cressona Mall Speedway, Rt. 61, Pottsville, PA 17901; (717) 385-3506



East St. Raceway & Art Center, 747 E. Railroad Ave., Verona, PA 15147; (412) 826-0602



High-Tek Hobbies Raceway, 13250 Rt. 30, North Huntingdon, PA 15642; (412) 864-5278



Hobby House Raceway, Downingtown Marketplace, Downingtown, PA 19335; J.T. Nelson, (215) 269-1300



Koontz's Home & Hobby Center, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866



L&R R/C Racing, 15 S. Main St., Red Lion, PA 17356; (717) 244-1108



Main Hobby Race Center, 107 Delaware St., Olyphant, PA 18447; Ziggy, (717) 489-4566



Marshall's R/C Raceway, RR4, Box 640, Honesdale, PA 18431; Bill or Dot Marshall, (717) 729-7458



Modellbahn Ott Hobbies, 1145 E. Philadelphia Ave. (Rt. 73), Gilbertsville, PA 19525; (215) 367-5925



New Garden Farms/Mushroom Bowl, 812 W. Cypress St., Kennett Square, PA 19348; Drew Pannell, (215) 444-1850



Performance Hobby, 1305 Main St., Slatington, PA 18080; (215) 760-9855



Phantom, 1520 Montrose, Philadelphia, PA 19146; (215) 545-3769



Prop & Wheels Raceway, 139 W. Broadway, Tamaqua, PA 18252; (717) 668-2288



Radio Controlled Pro Speedway, Rt. 487N, Stillwater, PA 17878; (717) 387-0266



Riverside Raceway, PA Ave. W & Hickory, Warren, PA 16365; Jeff Frailey, (815) 723-4211



T&T Radio Controlled Racing, Randolph Rd., Great Band, PA 18821; (607) 723-9357



TC's R/C's, 1537 Freeport Rd., Natrona Heights, PA 15065; Tom Coriale, (412) 226-8802



Wagonhill Hobbyland, RD3, Box 183, Slippery Rock, PA 16057; (412) 458-4711



RHODE ISLAND

East Bay Hobbies, 629 Metacom Ave., Bristol, RI 02809; (401) 254-0778



R/C Hobbies, 47 Sandybottom Rd., Coventry, RI 02816; (401) 823-4335



SOUTH CAROLINA

Berea R/C Speedway, 707 Sulphur Springs Rd., Greenville, SC 29611; (803) 246-4702



Inland R/C Speedway, 61 New Found Ln., Myrtle Beach, SC 29577; (803) 293-1753



LB Co. Hurricane, 112 Green Acres Rd., Blythwood, SC 29016; (803) 786-0984



Monaco's Raceway, 727 E. Buena Vista Ave., N. Augusta, SC 29841; Bill Loursion, (803) 279-8982



Palmetto Raceway, 5023A Rivers Ave., N. Charleston, SC 29418; (803) 566-0068



TBS Superspeedway, Hwy. 151, Darlington, SC 29532; (803) 395-1551 or 332-7117



TBS Superspeedway, 800 Hwy. 15N, Hartsville, SC 29550; Johnny Tiller, (803) 332-7117



SOUTH DAKOTA

Dakota Off-Road Racers, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604



TENNESSEE

D&M's Downtown Raceway, 8 North White St., Athens, TN 37303; (615) 745-4288



The Dirt Dome, 575 W. Poplar Ave., Memphis/Collierville, TN 38017; (901) 853-3428



Lail Speedway, 812 Wells Rd., Maryville, TN 37801; Jack or Chris Lail, (615) 983-9207



Tuckasee Off-Road Raceway, 1104 Lafayette Rd., Clarksville, TN 37042; (615) 645-2635



TEXAS

AA Raceway, 1617 Toomey Rd., Austin, TX 78704; (512) 474-8277



Austin R/C Center, 9702 Gray Blvd., Austin, TX 78758; Caton Cobb, (512) 832-8144



Budget Raceway, RR 1, Box 400 I-35, Bruceville, TX 76630; (814) 859-5296



Checkered Raceway, 8100 Kirkwood, Houston, TX 77072



Competition Hobbies Raceway, 309 W. Hwy. 190, Copperas Cove, TX 76522; Larry Gholson, (817) 547-7505



Finish Line Hobby Store & Raceway, 11925 Jones Maltsberger, San Antonio, TX 78016; (512) 491-0088



Hal's R/C Raceway, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213



Hi-Tech Hobbies, 1107 Port Neches Ave., Port Neches, TX 77651; (409) 724-2391



Indy R/C World, 220 Mesquite Village, Mesquite, TX 75150; (214) 686-7744



Norm's R/C Hobbies & Raceway, 2551 Lombardy, Suite 160, Dallas, TX 75220; Norm Mazzola, (214) 357-3453



R/C Pro Shop, 3303 N. Midkiff, Midland, TX 79705



Spring Creek R/C, 45 Fisherman's Rd., San Angelo, TX 76904; (915) 944-3850



TK's R/C Park, 2921 Old Claude Hwy., Amarillo, TX 79101; (806) 622-0017



Z Track, 1550 Dunnam Dr., Abilene, TX 79602; Chi Chi, (915) 692-8477



UTAH

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; (801) 250-8303



W.O.R. Raceway, 3150 Brinker Ave., Ogden, UT 84401



VERMONT

Bradford R/C Racing, Box 309, Rt. 25, Bradford, VT 05033; Rodney & Michelle, (802) 222-9226



Hansen Intermountain R/C Raceway, 8481 W. 2700 S., Magna, VT 84044; Kevin Hansen, (801) 250-8303



Mikes Hobbies & Raceway, 162 N. Main St., Rutland, VT 05701; (802) 775-0059



Silver Towers Raceway, Elks Club, North Ave., Burlington, VT 05401; (802) 658-4490



VIRGINIA

A-1 Raceways, 940 Radford Rd., Christiansburg, VA 24703; Kay or Charles Franks, (703) 382-1173



Bob's Hobbies & Raceway, 910-J Brandy Creek Dr., Mechanicsville, VA 23111; Bob Wagner, (804) 746-2758



Cooper's R/C Raceway, Rt. 4, Box 12203, Chatham, VA 24531; (804) 724-4182



Mid Atlantic Raceway, 89 E. Elizabeth St., Harrisburg, VA 22801; (703) 433-3952



The Race Place, 3180 King William Ave., Westpoint, VA 23181; (804) 843-4933



Winners Circle, 3236 W. Clay St., Richmond, VA 23230; (804) 355-7076



WASHINGTON

Alfie's, 108 South K St., Aberdeen, WA 98520; (206) 533-6638



Arlington Heights Speedway, 13629 228th St. NE, Arlington, WA 98223; Shawn Bussert, (206) 435-3442



Four Seasons R/C Racing, 146 School St. SE, Olympia, WA 98506; (206) 491-2430



Hank Perry Race Complex, Sullivan Rd., WA 99213; (509) 927-1879



Tacoma R/C Raceway Hobbies, 6305 6th Ave., Tacoma, WA 98406; (206) 565-1935



WEST VIRGINIA

R/C Race Place, Rt. 10, Box 351, Morgantown, WV 26505; (304) 292-0811



WISCONSIN

Fox Valley Off-Road Racing Club, R1, Mayflower Rd., Hortonville, WI 54944; (414) 739-9211



Frog's R/C Raceway, Rt. 1, Phillips, WI 54555; (715) 339-2314 or 339-2958



Hobbytown Speedway, 4231 8th St. S., Wisconsin Rapids, WI 54494; (715) 421-1222



Hobby World Speedway, 3198 London Rd., Eau Claire, WI 54701; (715) 834-0456



JJ's Dirt Heaven, 6028 County K, Champion, WI 54229; (414) 866-9096



Maniac Motors Raceway, 244 Rt. 1 A1 Rt. H, Kendall, WI 54638; (608) 847-4833



MARCCA Raceways, 1810 S. Park St., Madison, WI, 53713; Jeff Gundlach, (608) 273-0519



Midwest Tri-Clone, 144 N. Main St., West Bend, WI 53095; (414) 334-0487



The Pits Hobby Shop, 786 Morris Ave., Green Bay, WI 54304; (414) 494-4200



R/C Spectacular, Milwaukee Mecca Auditorium, c/o Wisconsin Motorsports Show, 11020 W. Rogers, Milwaukee, WI 53227; (414) 327-3999



Stoltz Raceways, 548 Summit Dr., West Bend, WI 53095; (414) 338-6097



West Bend Hobbies, 144 N. Main St., West Bend, WI 53040; (414) 334-0487



CANADA

Aprilia Track, 20 Parsons Ridge, Kanata, Ontario, Canada K2L 2N4; (613) 836-2577



Autodrome des Laurentides, 1003 Rue Lauzanne, Belle Feuille, Quebec J0R 1A0; Jean-Marc Morin, (514) 438-0907



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

Autodrome des Prairie, 935 Boul. St-Luc, St-Luc, Quebec J0J 2A0; (514) 348-0718



Autodrome Sher-Hobby, 1035 Panneton, Sherbrooke, Quebec; (819) 820-1151



Cantraxx Raceway, 8876-48 Avenue SE, Edmonton, Alberta T6E 5L1; (403) 469-9193



Circuit R/C Bonzai, 164 Cowie, Granby, Quebec, Canada J2G 3V3; (514) 372-3622



Circuit St-Denis Auto Téléguidée, 292 DuLion, St-Denis sur Richelieu, Quebec, J0H 1K0; Francois Rivard, (514) 787-1127



Crash Course, Box 9, Site 8, RR #1, Spruce Grove, Alberta T7X 2T4; Tim Starreveld (403) 963-5795



CRCD, 4565 Bh St-Joseph, Drummondville, Quebec J2A 1B4; Jacques Lefebvre, (819) 474-4001



GRSCR, 9 Gauthier, St-de L'Achigan, Quebec J0K 3H0; (514) 588-4254



Hobby Center, SQS.210 Bl.H Apt. 204, Brasilia, DF-Brasil 70.273; 061-242-0488



Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; (519) 354-5530



J-T International Raceway, 127 Milligan Lane, Napanee, Ontario K7R 8A1; (613) 354-0099



Quintrax Speedway, Box 1034, Belleville, Ontario, K8N 5B6; (613) 962-1414; Fax; (613) 962-7306



Rousillon Hobby Track, 177-D St-Jean Baptiste, Chateauquay, Quebec J6K 3B4; (514) 698-2151



Universal R/C Speedway, Niagara St., Welland, Ontario; (416) 735-5051



MEXICO

Hobby's Formula, Au observatorio 457, Mexico DF 01120; (905) 502-3620



R/C Baja Rosarito, Paraiso Ranch, Rosarito Beach, Baja California; 011,526-612-0495



JAPAN

Misawa R/C Raceway, 13th Fighter Squadron, PSC 76, Box 2585, APO AP 96139-2585; 011-81-176-53-5181, ext. 226-6506



SPAIN

ROARCR, Naval Station, Rota, Spain (P.O. Box 53, FPO NY NY 09540-0013); PO Kelly Sexton, 011-34-56-822652



ZIMBABWE

Mosi-Oa-Tunya, H9619 Highland Harare, Harare Country, Maslortaland, Zimbabwe; 46237



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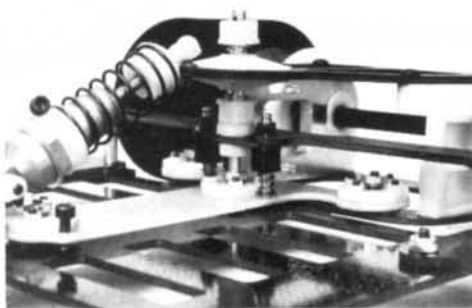
(Check all that apply)

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|-----------------------------------|---|
| <input type="checkbox"/> Indoor | <input type="checkbox"/> Concrete |
| <input type="checkbox"/> Outdoor | <input type="checkbox"/> Asphalt |
| <input type="checkbox"/> Off-road | <input type="checkbox"/> On-site hobby shop |
| <input type="checkbox"/> Oval | <input type="checkbox"/> AC power |
| <input type="checkbox"/> Banked | <input type="checkbox"/> Automatic lap-counting |
| <input type="checkbox"/> Dirt | <input type="checkbox"/> Food available |
| <input type="checkbox"/> Carpet | <input type="checkbox"/> Handicap access |

Return to Track Directory, *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897

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LETTERS

(Continued from page 164)

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PETE LAMARA
Helena, MT

Well, Pete, if you, like, want some custom decals that, like, say what you want 'em to, why don't you, ya know, get in touch with R/C Graphix, 3235 Harms Way, Snellville, GA 30278; (404) 985-0755; Fax (404) 962-5881.

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Is there a way to modify my JR-XT tranny so that it can compete against the cars that use Associated Stealth trannys? Does Losi have anything new on the drawing board?

BRETT PETERSON
Eagan, MN

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(Continued on page 182)

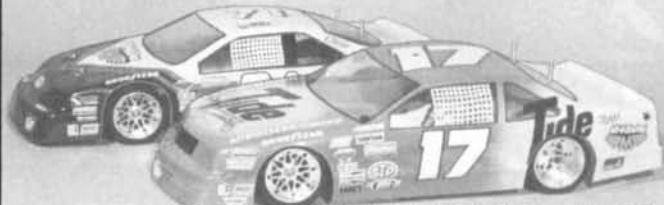
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Track Directory

YOUR 1992 TRACK GUIDE

ALABAMA

"Lil" TST R/C Raceway, 32 St. N., Alabama City, AL 35904; (205) 547-0072



R/C Hi-Tech Raceway, 3303 Meridian St., Huntsville, AL 35811; Rick Chambers, (205) 539-1347



ALASKA

ARCORR, Fairbanks St., Anchorage, AK 99507; Leon Farenthold, (907) 349-1950 (evenings)



McKinley Hobby & Raceway, 2300 McKinley Dr., Wasilla, AK 99654; (907) 376-9351



ARIZONA

R/C Sports Mania, 3550 N. 35th Ave., Phoenix, AZ 85028; (602) 272-3165



Scale Racing Sports, 1120 N. Hayden Rd., Tempe, AZ 85281; Mike Dolan, (602) 829-9117



ARKANSAS

AERCC, Vimy Ridge Rd., Little Rock, AR; (501) 945-7037



Arkansas Int'l. Superspeedway, Rt.4, Stokes Rd., Pine Bluff, AR, 71602; (501) 247-1488



R-C Wheelz, 2630 Piko Ave., N. Little Rock, AR 72114; (501) 758-3330



CALIFORNIA

California Auto Racers (CAR), 96 San Tomas Aquino Rd., Campbell, CA 95008; (408) 749-9751



City Speedway, 7750 Convoy Ct., San Diego, CA 92111; (619) 560-9633



Desert R/C Raceway, 39360 3rd St. E., Suite 305, Palmdale, CA 93550; (805) 272-1835



Fast Eddie's R/C Raceway, 3261 Edward Ave., Santa Clara, CA 95054; Eddie Aflague, (408) 986-8256



Fast Lane, 25845 San Fernando Rd., #21, Saugus, CA 91350; (805) 255-2404



Frogtown R/C Raceway, Motherlode Hobbies, 3069 Hwy. 49, Angels Camp, CA 95222; (209) 736-4989



Hobbycrafters Raceway, 323 Five Cities Dr., Pismo Beach, CA 93449; (805) 773-6765



Hobbytown USA Raceway, 4006 Foothills Blvd., Suite 101, Roseville, CA 95678; Mike Galloway, (916) 773-5062



Jackman's R/C Raceway, 1616 N. Beale Rd., Marysville, CA 95901; Bonnie or Harry Jackman, (916) 741-3744



K&M R/C Raceway, 22474 A Barton Rd., Grand Terrace, CA 92324; Mike Blake, (714) 783-0899



Lindsey's R/C Raceway, P.O. Box 443, Doyle, CA 96109; (916) 827-2457



One-Stop Raceway, 3782 Cerritos Ave., Los Alamitos, CA 90720; (213) 493-7597



Outlaw R/C Hobbies, 7920 Webster, San Bernardino-Highland, CA 92346; Rick James or Paul Nadeau, (714) 864-1770



Paso Robles R/C, P.O. Box 3795 (3980 Linne Rd.), Paso Robles, CA 93447; (805) 237-0624



The Race Place, 13564 E. Imperial Hwy. Unit G, Santa Fe Springs, CA 90670; (213) 926-7711



Radio-Controlled Hobbies, 2011 Placentia Ave., Costa Mesa, CA 92630; (714) 631-1555



R/C Sports, 1009 Alamo Dr., Vacaville, CA 95688; (707) 446-5555



R/C World, 5759 E. Fountain Way, Suite 101, Fresno, CA 93727; (209) 348-9409



Robin's Racing World, 1844 W. Glenoaks, Glendale, CA 91201; (818) 240-2093



Roy's Raceway, 368 E. 11th St., Tracy, CA 95516; (209) 836-3513



San Diego R/C Car Club, P.O. Box 232456, San Diego, CA 92193; (619) 560-0089



SRS Raceway, 915 N. Main St., Salinas, CA 93906; (408) 424-4044



Trains, Planes, Automobiles, 1260 Oddstad, Redwood City, CA 94062; (415) 365-7500



Tyler's RC/RD Racing Center, 6865 Flanders #D, San Diego, CA 92121; (619) 597-3072



Woodbridge R/C Speedway, Irvine, CA. Contact Dave Anderson, (714) 551-5007



Yorba Linda R/C Speedway, 3780 Prospect #B, Yorba Linda, CA 92686; David Landier, (714) 572-2175



COLORADO

Action R/C Raceway, 4939 N. Broadway #57, Boulder, CO 80304; (303) 440-0330



Colorado R/C Speedway, 6520 Wadsworth Blvd. #130, Arvada, CO 80003; (303) 425-1718



Edora Park R/C Speedway, Edora Park, Ft. Collins, CO 80524; (303) 482-0197



Hot Lap Hobbies & Raceway, 4206 Wadsworth, Wheat Ridge, CO 80034; Phil Cotter, (302) 420-3051



MHOR R/C Raceway, 15540 E. Batavia Dr., Aurora, CO 80011; (303) 343-0151



R/C World & Track, 2788 S. Federal Blvd., Denver, CO 80236; (303) 789-0838



CONNECTICUT

Connecticut R/C Off-Roads, Old Field School, Mona Terrace, Fairfield, CT 06430; (203) 661-0145



High-Tech Raceway, 374 Enfield St., Enfield, CT 06082; (203) 745-8488



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

Hobby World Raceways, 161-6 Woodford Ave., Plainville, CT 06062; (203) 793-1111



K/N R/C Speedway Inc., West St., Stafford Springs, CT 06076; (203) 684-9896



R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (203) 741-6501



R/C Raceways Inc., 1265 John Fitch Blvd., South Windsor, CT 06074; (203) 528-3661



R/C World/Sugar Hollow Speedway, 66 Sugar Hollow Rd., Danbury, CT 06810; (203) 748-2185



SCORA/Clayton's Off-Road Racing, 141A Middletown Ave., North Haven, CT 06473; Craig or Keith, (203) 234-CLAY



Wallingford Indoor Racing, 63 N. Cherry St., Wallingford, CT 06492; (203) 265-3939



DELAWARE

NT Raceway, Alt 13 South, Seaford, DE 19973; (302) 628-0520



FLORIDA

i-fifty-5 Raceway, County Rd. 555, Bartow, FL 33830; (813) 324-7406 (Chuck Nolke)



I-T R/C Central, 811 Playground Rd., Fort Valton Beach, FL 32547; (904) 863-2666



ranford R/C Speedway, Rt. 3, Box 240, ranford, FL 32008; (904) 935-0758



ontinental Racing, 5335 N. Military Trail, West Palm Beach, FL 33407; (409) 697-167



oral Springs Roadrunners, P.O. Box 632, Coral Springs, FL 33075; Tom Ilison, (305) 721-0344 or Rick Schwartz, (305) 344-1983



Ft. Lauderdale Speedway, Mills Pond Park, 2201 NW 9th Ave., Ft. Lauderdale, FL 33311; Jack Koons, (305) 424-6617



Greater Orlando Auto Racers, 960 Keller Rd., Altamonte Springs, FL 32779; Dave Mottin, (407) 293-7090



H&H Raceway, 4121 S. Tamiami Tr., Sarasota, FL 34231; (813) 922-7711



Hialeah Hobby Raceway, 4562 W. 12 Ave., Hialeah, FL 33015; (305) 826-3702



JARCAR/Hobby World, 7273 103rd St., Jacksonville, FL 32210; (904) 772-9022



Lake Whipoorwill International Speedway, 12345 Narcoossee Rd., Orlando, FL 32827; Bob Hosh, (407) 277-9586; fax (904) 759-3993



Lou's R/C Hobbies & Raceway, 1512 SE Village Green Dr., Port St. Lucie, FL 34952; (407) 337-9000



M&M R/C Raceway, 16921 Waterline Rd., Bradenton, FL 34202; Mike Williams, (813) 747-2889



PBG R/C Motor Park, 4399 Lilac St., Palm Beach Gardens, FL 33410; (407) 624-9252



Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615



Raceway Hobbies, 1115-J Enterprise Court, Holly Hill, FL 32117; (904) 258-7537



Ray's Track & Hobby, 4605 W. Cayuga St., Tampa, FL 33614; (813) 872-8662



Rental Raceway, 3655 S. Hopkins Ave., Titusville, FL 32780; (407) 383-0631



St. Augustine R/C Speedway, 99 Masters Dr., St. Augustine, FL 32095; (904) 824-6357



Space Coast Raceway, 563 Barton Blvd., #17, Rockledge, FL 32955; Bill Pinch, (405) 631-4373



Sun Valley Speedway, Palmer Blvd., Sarasota, FL 34232; (813) 322-1200; (mailing address: Rt. 1, Box 443N, Myakka City, FL 34251)



West Coast R/C Club, Lake Park, 8607 May Cr., Tampa, FL 33614; (813) 932-3650



Wilbur Avenue Raceway, 1848 Wilbur Ave., Vero Beach, FL 32960; (407) 567-1200



GEORGIA

Case R/C Raceway, P.O. Box 1061, Trenton, GA 30752; (404) 657-6789



Dalton Raceway, 2300 Chattanooga Rd., Dalton, GA 30720; (404) 226-6699



Georgia Hobby Center, 112 Kenwood Rd., Fayetteville, GA 30214; (404) 460-1753



Good Life City Raceway, 6606 Newton Rd., Albany, GA 31707; (912) 888-2515



Lake Mayer Raceway, 1 Melinda Circle, Savannah, GA 31460; Phil Hurd, (912) 355-6033



Peach Bowl R/C Speedway, 2035 Westside Ct., Snellville, GA 30278; (404) 985-1448



The Racer's Edge, 1530 Hwy. 19 North, Thomaston, GA 30286; Mark or Roger Walls, (404) 648-6534



Sandy Cross Speedway, Rt. 1, Box 1073, Royston, GA 30662; Morris Phillips or Wayne Fowler, (404) 245-9573



Silver Wings Raceway, 5611 Riverdale Rd., College Park, GA 30349; (404) 991-2225



IDAHO

Falls Hobbies & R/C Raceway, 1515 Northgate Mile, Idaho Falls, ID 83401; (208) 529-8650



ILLINOIS

Ameri-Trac, R3, Box 242, Mattoon, IL 61938; (217) 234-8707



Badlands II, 320 W. Jackson St., Vandalia, IL 62471; (618) 283-2913



B.A.R.R., 809 River Dr., Byron, IL 61010; Jim Haynes, (815) 234-5615



Eagle Speedway, 303 N. Plum St., Pontiac, IL 61764; (815) 842-1738



Ebbtide Hobbies & Raceway, 865 N. Main St., Antioch, IL 60002; Jim Schaefer, (708) 395-8433



Hobby Town Raceway, 4915 W. Rt. 120, McHenry, IL 60050; Mike Hollingsworth (815) 344-1777



JC Hobbies/Metro Motor Speedway, Metropolis Airport, Metropolis, IL 62960; (618) 524-9979



JMP Raceway, 952 Harrison Ave., Wood River, IL 62095; (618) 258-0297 or -0282



Leisure Hours Hobbies, 2872 Plainfield Rd., Joliet, IL 60435; (815) 439-1477



Lisle Community Park Raceway, 1825 Short St., Lisle, IL 60532; (708) 416-6944 (Jim Bernicky)



Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61111; (815) 282-1311



Magnum R/C Speedway, RR#2, Box 399, Danville, IL 61832; Terry & Nancy Dines, (217) 446-2472



Midwest Hobby Trax R/C Raceway, 114 Kirkland Circle, Unit A, Aswego, IL 60534; Duane Pierson or John Koonce, (708) 978-RACE



Monee R/C Raceway, 26049 Ridgeland Ave., Monee, IL 60449; (708) 534-2422



R/C Speed Zone, 1400 E. Lafayette, Bloomington, IL 61701; (309) 662-RACE



Redline Raceway, 921 Harding, Calumet City, IL 60409; (708) 862-8181



SIRCAR Raceway, 1200 North Marion, Carbondale, IL 62901; (618) 549-5885



Slot Wing Hobbies Race Place, 1615 W. Springfield, Champaign, IL 61821; (217) 359-1920



Smithton Community Park, P.O. Box 8152, Belleville, IL 62221; (618) 236-7569



Superior Raceway, 1706 W. Bradley, Champaign, IL 61821; (217) 359-8073



Thunderroad Speedway, 5 W. Division St., Coal City, IL 60416; A. Cooley, (815) 634-8184



Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; (815) 332-4516



INDIANA

BJ's Riverside Raceway, 265 S. Clay St., Jasper, IN 47546; Joe Lorey, (812) 482-3484



Blaze'n Race'n, P.O. Box 6, Hamlet, IN 46532; James Berndt, (219) 867-1324



Boone County R/C Track, 1300 E. 100 S. Rd., Lebanon, IN 46052; Jerri Moss, (317) 293-2225



CC Hobby & Speedway, RR 1, Box 68, Francesville, IN 47946; (219) 567-2447



County Line R/C, 2333 West State Road 38, Sheridan, IN 46069; Greg Welch, (317) 758-6393



Gonzo Raceway, 418 Roberts Rd., Chesterton, IN 46304; (219) 980-8409



Hobby Barn Raceway, 1950 Springhill, Terre Haute, IN 47802-9694; (812) 299-5773



K&L Hobbies, 7 Raceway, 2751 N. State Rd. 39, La Porte, IN 46350; (219) 324-0353



Master Hobbies, 8501 Bash Rd., Indianapolis, IN 46250; Tim or Dan, (317) 576-1961



Mooresville R/C Hobby, 7 Moore St., Mooresville, IN 46158; (317) 831-8877



Mooresville R/C Hobby, 9201 S. State Rd. 67, Camby, IN 46113; (317) 831-8877



PITT, 1244E 700N, Ossian, IN 46777; (219) 622-4591



R/C World of Indiana, RR #2, Box 335, Lynn, IN 47355; (317) 874-2464



Radio Car Craft, 1925 S. Curry Pike, Bloomington, IN 47403; (812) 332-3245



IOWA

Kodiak Race Track, Box 78, Okoboji, IA 51355; Brad or Dave, (712) 332-7982



Mr. Car Raceway, Central Iowa Fairgrounds, Marshalltown, IA 50158; (515) 483-2234



North Park R/C Speedway, 805 S. Jerome, Algona, IA 50511; (515) 295-9352



Plymouth County R/C Speedway, 4th Ave. NE (Plymouth County Fairgrounds), LeMars, IA 51031; (712) 546-8788 or 546-9522



Power House Racing, 1200 S. Division St., Creston, IA 50801; (515) 782-4582 or 782-4174



Rotunda Raceway, 101 Bass, RR 1 Box 155A, Storm Lake, IA 50588; (712) 732-4555



Sibley Raceway, Osceola County Fairgrounds, Sibley, IA 51249; Al Reck (712) 754-2604 (day) or 754-3613 (night)



Southwest Iowa R/C Raceway, Kelly Park, Red Oak, IA 51566; (712) 623-5513



Southwest Iowa R/C Raceway, Montgomery County Fairgrounds, Red Oak, IA 51566; (712) 623-5513



Team Johnson Speedway, Jct. Hwy. 34 & 406, West Burlington, IA 52655; (319) 753-0753



KANSAS

Chad's R/C World & Raceway, 217 Brownie Ave., P.O. Box 76, Scranton, KS 66537; (913) 793-2313



Pittsburg International Mini Speedway, 511 1/2 N. Locust, Pittsburg, KS 66762; (316) 232-1973



R/C Superdome & TQ Pro Shop, 14 East Avenue A, Hutchinson, KS 67501; (316) 665-6633



Spring Creek Raceway, 7257 W. Cloud St., Salina, KS 67401; (913) 823-8992



KENTUCKY

Bluegrass Int'l/Perry's R/C Hobbies, 214 Globe St., Radcliff, KY 40160; William Perry, (502) 351-RACE



Fast Lane Hobbies, 6132 Scottsville Rd., Bowling Green, KY 42104; (502) 782-2419



Hobbys Plus, 819 Main St., Hazard, KY 41701; Joe Mavaro, (606) 436-3175



The Lexington Autodrome Raceway, 2753 Richmond Rd., Lexington, KY 40509; (606) 269-7794



Remote-Control Hobby Shop/Raceways, Rt. 8, Box 211, Mayfield, KY 42066; (502) 247-4715



River Cities Raceworld, 1104 Powell Lane, Flatwoods, KY 41139; (606) 836-CARS



LOUISIANA

Acadiana R/C Hobbies & Raceway, 120 Toledo Dr., Lafayette, LA 70506; (318) 235-5825



Cajun R/C Raceway, Rt. 2, Box 288 Hwy. 343, Church Point, LA 70525; (318) 873-3855



The Hobby Shop Track, 110A Darbonne, Sulphur, LA 70663; (318) 527-9129



Oakdale Raceway, 1259 Hwy. 165 S., Oakdale, LA 71463; M.L. Jeziorski, (318) 335-3532



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

MAINE

Central Maine R/C Speedway, 18 Lithgow St., Winslow, ME, 04901; David Prescott, (207) 877-2232



Rocket R/C Hobbies, Annabessacook Rd., Winthrop, ME 04364; (207) 377-6910



Team Terminator Off-Road Track, c/o Hobbies Plus, 479C Elm St., Biddeford, ME 04005; (207) 282-8838



The Racers' Club, 85 Hubbard Rd., P.O. Box 160, Berwick, ME 03901; (207) 698-5337



MARYLAND

ABC Raceway, 2825 Ocean Gateway, Cambridge, MD 21613; (301) 228-4291



Cliff's R/C Raceway, 4727 Conowingo Rd., Darlington, MD 21034; Doug, (301) 538-3135



Doug's Hobby Shop Raceway, Rt. 301N, Box 32B, Waldorf, MD 20601; (301) 843-7774



Friendship Off-Road Racers, 1531 Florida Ave., Severn, MD 21144; (301) 551-3050



GPA Speedway, 3498 Crain Hwy., Bowie, MD 20715; George Cole, (301) 805-9004



Off-Road Headquarters Indoor Raceway, 5640 K Sunnyside Ave., Beltsville, MD 20705; (301) 474-1246



Suzie Goose Hobbies, 718 E. Gude Dr., Rockville, MD 20850; (301) 279-2966



MASSACHUSETTS

Archer's Lane R/C Raceway, 11B Washington St. (Rt. 1), S. Attleboro, MA 02730; (508) 399-6762



CKS Raceway, 46 Wilbraham St., Palmer, MA 01069; (413) 283-2260



Megadrome Raceway, North Adams Plaza, Rt. 8, North Adams, MA 01247; (413) 743-7223



Mike's Speedway, Rt. 9, Mt. Farms Mall, Hadley, MA 01035



Naytrix Raceway, Holmes Rd., Pittsfield, MA 01201; Rick Welch or Nate Zuckerman (413) 443-2488 or 443-9886



R/C Hobbies & Speedway, 1311 Purchase St., New Bedford, MA 02740; (508) 991-5040



West St. Hobbies, 114C Main St., Medway, MA 02053; (508) 533-1231



MICHIGAN

Baja Bayou Off-Road Raceway, 5313 West 22 Mile Rd., Tustin, MI 49688; (616) 829-3447



Can-Am Hobbies Speedway Park, 1148 Gratiot, Marysville, MI 48040; (313) 364-3338



Cereal City R/C Off-Roaders, 2000 E. Columbia Ave., Battle Creek, MI 49015; (616) 963-2506



Fun Tyme High Banked Oval, Fun Tyme Adventure Park, 6295 E. Saginaw Hwy, Grand Ledge, MI 48837; (517) 655-5503



Jonimo Hobby & Raceway, 27788 Joy Rd., Livonia, MI; (313) 422-1830



Ludington R/C Raceway, 1483 N. Dennis Rd., Ludington, MI 49431; (616) 843-4654



Mason County R/C Car Track, West Shore Community College, (611 N. Washington Ave., Ludington, MI 49431) Scottsville, MI 49454; (616) 843-8553 or 843-4837



More R/C Club, 33538 23 Mile Rd., Ches-terfield Township, MI 48047; (313) 773-5918 (Tom Kelly) or 749-9774 (Joe)



Off-Road Speedway, 1940 Lakeville Rd., #28, Oxford, MI 48371; (313) 628-4320



Pointe R/C, 2119 Summerton Rd., Mt. Pleasant, MI 48858; Frank, (517) 773-5711



R&L Hobbies, 10334 Portage Rd., Portage, MI 49002; (616) 323-3686



R.G. Enterprises, 600 N. Lafayette, Greenville, MI 48838; (616) 754-4919



Rider's Superspeedway, 42040 Koppernick, Suite 400, Canton, MI 48187; Brent Martin, (313) 451-5599



Rider's Superspeedway, 4415 S. Westledge, Kalamazoo, MI 49008; Ken Penn (616) 349-2666



USA Raceways, 6083 Dixie Hwy., Bridgeport, MI 48722; (517) 777-7USA



MINNESOTA

Wild West R/C Speedway, 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 722-6248



Minn-E-Golf & Hobby, 9100 Park Ave., Elk River, MN 55330; (612) 441-8365



MISSISSIPPI

Norm's R/C Hobbies, 310 E. Beach Blvd., Long Beach, MS 39560; (601) 863-0524



Precision Hobbies, 240 Eisenhower Dr., Biloxi, MS 39531; (601) 388-6346



Small Cars Unlimited, 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST



MISSOURI

Doug's Hobbies, 5221 Veil of Tears, Jefferson City, MO 65109; (314) 893-5861



Gateway R/C Track & Hobbies, 255 Marshal Rd., P.O. Box 345, Valley Park, MO 63088; (314) 255-5844



Harrisonville Hobby Shop & Raceway, 2301 S. Commercial, Harrisonville, MO 64701; Richard Taylor, (816) 887-3055



Lafayette Riverside Raceway, P.O. Box 9663, Marshall Rd., Kirkwood, MO 63122; Don Laningham, (314) 966-8912



Outback Speedway & Hobby, 2810 Sutton Blvd., Maplewood, MO 63143; (314) 644-3383



R + Hobby, 590 Jungermann Rd., St. Peters, MO 63376; (314) 928-9838



MONTANA

Bozeman R/C Powerhouse Track, west side of the Main Mall, Bozeman, MT 59715; (406) 586-6461



Garden City Raceway, 6725 Hwy. 10 West, Missoula, MT 59802; (406) 721-5405



Magic City R/C Raceway, 14th St. W. & Central Ave., Billings, MT 59101; (406) 259-9004



NEBRASKA

The Salvation Army, 4032 Harrison St., Omaha, NE 68147-1012; Lt. Michael Delashmit, (402) 634-3414



NEVADA

Little City Hobbies Raceway, 640 Kuenzki, Reno, NV 89503; Gregg Allen, (702) 786-3611



NEW HAMPSHIRE

4-K Racing, 100 Warwick Rd, Winchester, NH 03470; (603) 239-6207



C.T. Hobbies R/C Raceway, 49 Eaton Rd., Auburn, NH 03032; (603) 483-2274



Hobbies Plus R/C Raceway, 14 Celina Ave., Nashua, NH 03063; (603) 882-9200



Hobby Etc., Heritage Place, Rt. 101A, Amherst, NH 03031; (603) 595-8549



R&B Racing, Lily Pond Rd., Gilford, NH 03246; Louie, (603) 524-2909 or Bud (603) 524-1893



NEW JERSEY

Action Raceway & Hobby Center, Rt. 295 & Harmony Rd., Gibbstown, NJ 08027; (609) 423-8933



Glassboro's Grand Oval Speedway, 167 S. Delsea Dr., Glassboro, NJ 08028; (609) 863-1551



Hopewell R/C Speedway, 138 West Broad St., Hopewell, NJ 08525; (609) 466-2715



Jackson R/C Racing, Marshall Ave., Jackson, NJ 08527; (908) 905-1593



L.B.R.A. Track, 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122



The Race Place, Rt. 33 & 34, Farmingdale, NJ 07727; (908) 938-5215



Radical Raceway & Hobbies, 100 Rt. 17S, Lodi, NJ 07644; (201) 843-6996



Tri-Oval Speedway & R/C Center, 296 S. Main St., Phillipsburg, NJ 08865; (908) 454-2223



Truck Challenge, 1162 Rt. 202-206N., Bridgewater, NJ 08807; Michael Gill, (908) 658-9616



Zeppelin Hobbies, 92 Rt. 23N, Riverdale, NJ 07457; Lou Ballini, (201) 831-7717



NEW MEXICO

The Pit/Las Cruces Hobby Raceway, 1996 A S. Valley Dr., Las Cruces, NM 88001; (505) 524-8530



Racers Inn, 4300 Rankin Ln. NE, Albuquerque, NM 87107; (505) 345-5988



NEW YORK

A&D's FasTracks, 1000 N. Main St., Brewster, NY 10509; (914) 279-2065



A&S Race Center & Hobbies, 120 Cayuga St., Canalview Mall, Fulton, NY 13069; (315) 598-2772



Bellmore Raceway, 2479 Charles Ct., Bellmore, NY 11710; (516) 783-3456 or 783-0105



Brockport Speedway, 6000 Sweden Walker Rd., Brockport, NY 14420; Gil & Betty Glidden, (716) 637-6224



Cars R/C & Guitars, 4360 Seneca St., West Seneca, NY 14224; (716) 674-0905



Central New York R/C Auto Racers, Martin St., P.O. Box 116, Rome, NY 13440; John Orr, (315) 336-5140



Chipmunk Hill R/C Speedway, 217 Pine St., Theresa, NY 13691; Ted House, (315) 628-5065



Dirt Track, 17 Fairway Dr., Manorville, NY 11949; Billy Wroblewski (516) 878-0737



East End Off-Roaders, Route 25A at Gull's Square, Wading River, NY 11792; (516) 929-8844



Eliminator Raceway, 125 Vermont Ave., North Babylon, NY 11703; Jim, (516) 321-6730



Island Hobbies & Raceway, 410 Commack Rd., Deer Park, NY 11729; (516) 254-6229



Lakeside Raceway & Hobbies, 712 Willow Ave., Ithaca, NY 14850; (607) 272-0248



Latest Hobbies & Raceway, Rt. 25A, Wading River, NY 11792; (516) 929-8844



LI 1/4-Scale Racers, 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384



Maspeth Raceway, Rust St. & 57th Rd., Maspeth, NY 11378; (718) 894-0800



Norwood Hobbies Raceway, 2-4 S. Main St., Norwood, NY 13668; Tom Jarvis, (315) 353-6621



Queens Off-Roaders, 42-12 13th St., Long Island City, NY 11101; (718) 392-5766



R/C Competition Corner, K-Mart Plaza, Mattydale, NY 13211; (315) 455-8718



R/C Hobbies, Rt. 49, Box 138, Constantia, NY 13044; (315) 623-9536



R/C Speedway & Hobbies, 1555 State St., Watertown, NY 13601; Steve Pena, (315) 788-1320



Riverside R/C & Hobby, P.O. Box 125, Rt. 126, Beaver Falls, NY 13305; (315) 346-1682



Russet's R/C Racetrack, 1793 Ridge Rd., Ontario, NY 14519; (315) 524-2522



Schenectady R/C Speedway, 955 State St., Schenectady, NY 12307; (518) 370-3747



Schoharie Co. R/C Car Club, P.O. Box 126, Cobleskill, NY 12043; (518) 234-4600



Skaneateles Raceway & Hobby, P.O. Box 102, Rt. 20, W. Genesee St., Skaneateles, NY 13152; (315) 685-8077



South Shore Hobby & Raceway, 311 W. Roe Blvd., Patchogue, NY 11772; Don Hauck, (516) 758-5567



Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291



Western New York R/C Speedway, 58 Spring St., Cuba, NY 14727; Jason Congdon, (716) 968-3586



NORTH CAROLINA

C&H Raceway, 1400 N. Cannon Blvd., Kannapolis, NC 28081; (714) 933-5321



Cape Fear Speedway, 107 Harley Rd., Wilmington, NC 28401; (919) 762-1184



Carolina R/C Drag Assoc., 907-C Warsaw Rd., Clinton, NC 28328; (919) 592-9489



Charlotte R/C Raceway & Hobbies, 5820 Old Concord Rd., Charlotte, NC 28213; (704) 597-0608



Clinton R/C Raceway, 907-C Warsaw Rd., Clinton, NC 28328; Corbitt Marshburn (919) 592-9489



Granite City R/C Raceway, 192-1 N. Main St., Mt. Airy, NC 27030; (919) 786-1466



Hi-Performance Hobbies & R/C Raceway, P.O. Box 320, Earl, NC 28038; Derrell Hollifield, Steve Bliss, (704) 482-4391



Hobby Park, 464 Knollwood St., Winston-Salem, NC 27103; (919) 768-2345



Jacksonville International Speedway, Hwy. 17N, Jacksonville, NC 28540; (919) 346-1522



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

Joe's Hobby Shop & Raceway, Rt. 2, Box 682-B, Bessemer City, NC 28016; (704) 435-2912



Mountain R/C Raceway, Hwy. 107N, P.O. Box 67, Glenville, NC 28736; (704) 743-3709



Reedy Creek Raceway, Rt. 14, Box 946, Conard Sowers Rd., Lexington, NC 27292; (704) 731-4022



Sandhills Raceway, Inc., US #1 South, Aberdeen, NC 28315; (919) 944-7414



Smiley Face Raceway, 120 W. Center St., Mebane, NC 27302; (919) 563-3822



TLC R/C Raceway, Rt. 6, Box 321-A, Hwy. 601, Mocksville, NC 27028; (704) 492-7569



NORTH DAKOTA

Crystal Springs Off-Road, 1200 53 Ave. SW, Minot, ND 58701; (701) 852-9590



OHIO

Alcraft's R/C Raceway, 1370 Custer-Orangeville Rd., Brookfield, OH 44003; (216) 448-1573



Classic Hobbies & Raceway, 2845 W. Waterloo Rd., Akron, OH 44312; (216) 628-3222



Hi-Tech Hobbies II, 116 Taylor St., Loveland, OH 45140; Rick Lewis, (513) 683-8900



Hobby Mania Raceway, 6597 Route 224, Lovellville, OH 44436; (216) 536-8282



Innovative Hobbies/Lakeside Speedway, 3427 Manchester Rd., Akron, OH 44319; (216) 645-1333



KAR R/C Raceway, 14511 Seacrest Rd., Salem, OH 44460; (216) 537-4039



Mid-Ohio R/C Raceway, 5367 Fishburg Rd., Huber Heights, OH 45424; (513) 233-2807



Way Out Hobbies, 5583 Centerpoint Rd., Georgetown, OH 45121; (513) 375-4984



Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025



OKLAHOMA

Off-Road R/C Autos of Tulsa, 13349 E. 11th #B, Tulsa, OK; (918) 251-5592



OKC Raceway, 6707 NW 10th, Oklahoma City, OK; (405) 495-4820



RCRC of Oklahoma, 400 S. Vermont, Suite 104, Oklahoma City, OK 73108; Robert Jones, (405) 942-RCRC



OREGON

Buggy Boogie Race Track, Rt. 4, Box 546, Astoria/Knapka, OR 97103; (503) 458-5357



Ed's Dirt Speedway, 2809 N. Cherry St., La Grande, OR 97850; (503) 568-4332



R/C Plus Hobbies Raceway, 2029 25th St. SE, Salem, OR 97302; (503) 364-9188



R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501; (503) 779-8298



Thunder Road, R/C Hobbies, 1624 Williams Hwy., Grants Pass, OR 97527; (503) 479-8701



PENNSYLVANIA

Brian's Raceway, 733 Flexer Ave., Allentown, PA 18103; (215) 435-1862



Clearfield R/C Car Club, P.O. Box 297, Clark Hill Rd., Hyde, PA 16843; Joe Welch (814) 765-3045



Cressona Mall Speedway, Rt. 61, Pottsville, PA 17901; (717) 385-3506



East St. Raceway & Art Center, 747 E. Railroad Ave., Verona, PA 15147; (412) 826-0602



High-Tek Hobbies Raceway, 13250 Rt. 30, North Huntingdon, PA 15642; (412) 864-5278



Hobby House Raceway, Downingtown Marketplace, Downingtown, PA 19335; J.T. Nelson, (215) 269-1300



Koontz's Home & Hobby Center, 1205 Hoover St., Pittsburgh, PA 15204; (412) 331-3866



L&R R/C Racing, 15 S. Main St., Red Lion, PA 17356; (717) 244-1108



Main Hobby Race Center, 107 Delaware St., Olyphant, PA 18447; Ziggy, (717) 489-4566



Marshall's R/C Raceway, RR4, Box 640, Honesdale, PA 18431; Bill or Dot Marshall, (717) 729-7458



Modellbahn Ott Hobbies, 1145 E. Philadelphia Ave. (Rt. 73), Gilbertsville, PA 19525; (215) 367-5925



New Garden Farms/Mushroom Bowl, 812 W. Cypress St., Kennett Square, PA 19348; Drew Pannell, (215) 444-1850



Performance Hobby, 1305 Main St., Slatington, PA 18080; (215) 760-9855



Phantom, 1520 Montrose, Philadelphia, PA 19146; (215) 545-3769



Prop & Wheels Raceway, 139 W. Broadway, Tamaqua, PA 18252; (717) 668-2288



Radio Controlled Pro Speedway, Rt. 487N, Stillwater, PA 17878; (717) 387-0266



Riverside Raceway, PA Ave. W & Hickory, Warren, PA 16365; Jeff Frailey, (815) 723-4211



T&T Radio Controlled Racing, Randolph Rd., Great Band, PA 18821; (607) 723-9357



TC's R/C's, 1537 Freeport Rd., Natrona Heights, PA 15065; Tom Coriale, (412) 226-8802



Wagonhill Hobbyland, RD3, Box 183, Slippery Rock, PA 16057; (412) 458-4711



RHODE ISLAND

East Bay Hobbies, 629 Metacom Ave., Bristol, RI 02809; (401) 254-0778



R/C Hobbies, 47 Sandybottom Rd., Coventry, RI 02816; (401) 823-4335



SOUTH CAROLINA

Berea R/C Speedway, 707 Sulphur Springs Rd., Greenville, SC 29611; (803) 246-4702



Inland R/C Speedway, 61 New Found Ln., Myrtle Beach, SC 29577; (803) 293-1753



LB Co. Hurricane, 112 Green Acres Rd., Blythwood, SC 29016; (803) 786-0984



Monaco's Raceway, 727 E. Buena Vista Ave., N. Augusta, SC 29841; Bill Loursion, (803) 279-8982



Palmetto Raceway, 5023A Rivers Ave., N. Charleston, SC 29418; (803) 566-0068



TBS Superspeedway, Hwy. 151, Darlington, SC 29532; (803) 395-1551 or 332-7117



TBS Superspeedway, 800 Hwy. 15N, Hartsville, SC 29550; Johnny Tiller, (803) 332-7117



SOUTH DAKOTA

Dakota Off-Road Racers, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604



TENNESSEE

D&M's Downtown Raceway, 8 North White St., Athens, TN 37303; (615) 745-4288



The Dirt Dome, 575 W. Poplar Ave., Memphis/Collierville, TN 38017; (901) 853-3428



Lail Speedway, 812 Wells Rd., Maryville, TN 37801; Jack or Chris Lail, (615) 983-9207



Tuckasee Off-Road Raceway, 1104 Lafayette Rd., Clarksville, TN 37042; (615) 645-2635



TEXAS

AA Raceway, 1617 Toomey Rd., Austin, TX 78704; (512) 474-8277



Austin R/C Center, 9702 Gray Blvd., Austin, TX 78758; Caton Cobb, (512) 832-8144



Budget Raceway, RR 1, Box 400 I-35, Bruceville, TX 76630; (814) 859-5296



Checkered Raceway, 8100 Kirkwood, Houston, TX 77072



Competition Hobbies Raceway, 309 W. Hwy. 190, Copperas Cove, TX 76522; Larry Gholson, (817) 547-7505



Finish Line Hobby Store & Raceway, 11925 Jones Maltsberger, San Antonio, TX 78016; (512) 491-0088



Hal's R/C Raceway, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213



Hi-Tech Hobbies, 1107 Port Neches Ave., Port Neches, TX 77651; (409) 724-2391



Indy R/C World, 220 Mesquite Village, Mesquite, TX 75150; (214) 686-7744



Norm's R/C Hobbies & Raceway, 2551 Lombardy, Suite 160, Dallas, TX 75220; Norm Mazzola, (214) 357-3453



R/C Pro Shop, 3303 N. Midkiff, Midland, TX 79705



Spring Creek R/C, 45 Fisherman's Rd., San Angelo, TX 76904; (915) 944-3850



TK's R/C Park, 2921 Old Claude Hwy., Amarillo, TX 79101; (806) 622-0017



Z Track, 1550 Dunnam Dr., Abilene, TX 79602; Chi Chi, (915) 692-8477



UTAH

Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; (801) 250-8303



W.O.R. Raceway, 3150 Brinker Ave., Ogden, UT 84401



VERMONT

Bradford R/C Racing, Box 309, Rt. 25, Bradford, VT 05033; Rodney & Michelle, (802) 222-9226



Hansen Intermountain R/C Raceway, 8481 W. 2700 S., Magna, VT 84044; Kevin Hansen, (801) 250-8303



Mikes Hobbies & Raceway, 162 N. Main St., Rutland, VT 05701; (802) 775-0059



Silver Towers Raceway, Elks Club, North Ave., Burlington, VT 05401; (802) 658-4490



VIRGINIA

A-1 Raceways, 940 Radford Rd., Christiansburg, VA 24703; Kay or Charles Franks, (703) 382-1173



Bob's Hobbies & Raceway, 910-J Brandy Creek Dr., Mechanicsville, VA 23111; Bob Wagner, (804) 746-2758



Cooper's R/C Raceway, Rt. 4, Box 12203, Chatham, VA 24531; (804) 724-4182



Mid Atlantic Raceway, 89 E. Elizabeth St., Harrisburg, VA 22801; (703) 433-3952



The Race Place, 3180 King William Ave., Westpoint, VA 23181; (804) 843-4933



Winners Circle, 3236 W. Clay St., Richmond, VA 23230; (804) 355-7076



WASHINGTON

Alfie's, 108 South K St., Aberdeen, WA 98520; (206) 533-6638



Arlington Heights Speedway, 13629 228th St. NE, Arlington, WA 98223; Shawn Bussert, (206) 435-3442



Four Seasons R/C Racing, 146 School St. SE, Olympia, WA 98506; (206) 491-2430



Hank Perry Race Complex, Sullivan Rd., WA 99213; (509) 927-1879



Tacoma R/C Raceway Hobbies, 6305 6th Ave., Tacoma, WA 98406; (206) 565-1935



WEST VIRGINIA

R/C Race Place, Rt. 10, Box 351, Morgantown, WV 26505; (304) 292-0811



WISCONSIN

Fox Valley Off-Road Racing Club, R1, Mayflower Rd., Hortonville, WI 54944; (414) 739-9211



Frog's R/C Raceway, Rt. 1, Phillips, WI 54555; (715) 339-2314 or 339-2958



Hobbytown Speedway, 4231 8th St. S., Wisconsin Rapids, WI 54494; (715) 421-1222



Hobby World Speedway, 3198 London Rd., Eau Claire, WI 54701; (715) 834-0456



JJ's Dirt Heaven, 6028 County K, Champion, WI 54229; (414) 866-9096



Maniac Motors Raceway, 244 Rt. 1 A1 Rt. H, Kendall, WI 54638; (608) 847-4833



MARCCA Raceways, 1810 S. Park St., Madison, WI, 53713; Jeff Gundlach, (608) 273-0519



Midwest Tri-Clone, 144 N. Main St., West Bend, WI 53095; (414) 334-0487



The Pits Hobby Shop, 786 Morris Ave., Green Bay, WI 54304; (414) 494-4200



R/C Spectacular, Milwaukee Mecca Auditorium, c/o Wisconsin Motorsports Show, 11020 W. Rogers, Milwaukee, WI 53227; (414) 327-3999



Stoltz Raceways, 548 Summit Dr., West Bend, WI 53095; (414) 338-6097



West Bend Hobbies, 144 N. Main St., West Bend, WI 53040; (414) 334-0487



CANADA

Aprilia Track, 20 Parsons Ridge, Kanata, Ontario, Canada K2L 2N4; (613) 836-2577



Autodrome des Laurentides, 1003 Rue Lauzanne, Belle Feuille, Quebec J0R 1A0; Jean-Marc Morin, (514) 438-0907



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- Off-road
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- Dirt oval
- Carpet
- Concrete
- Asphalt
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- AC power
- Automatic lap-counting
- Food available

Track Directory

Autodrome des Prairie, 935 Boul. St-Luc, St-Luc, Quebec J0J 2A0; (514) 348-0718



Autodrome Sher-Hobby, 1035 Panneton, Sherbrooke, Quebec; (819) 820-1151



Cantraxx Raceway, 8876-48 Avenue SE, Edmonton, Alberta T6E 5L1; (403) 469-9193



Circuit R/C Bonzai, 164 Cowie, Granby, Quebec, Canada J2G 3V3; (514) 372-3622



Circuit St-Denis Auto Téléguidée, 292 DuLion, St-Denis sur Richelieu, Quebec, J0H 1K0; Francois Rivard, (514) 787-1127



Crash Course, Box 9, Site 8, RR #1, Spruce Grove, Alberta T7X 2T4; Tim Starreveld (403) 963-5795



CRCD, 4565 Bh St-Joseph, Drummondville, Quebec J2A 1B4; Jacques Lefebvre, (819) 474-4001



GRSCR, 9 Gauthier, St-de L'Achigan, Quebec J0K 3H0; (514) 588-4254



Hobby Center, SQS.210 Bl.H Apt. 204, Brasilia, DF-Brasil 70.273; 061-242-0488



Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; (519) 354-5530



J-T International Raceway, 127 Milligan Lane, Napanee, Ontario K7R 8A1; (613) 354-0099



Quintrax Speedway, Box 1034, Belleville, Ontario, K8N 5B6; (613) 962-1414; Fax; (613) 962-7306



Rousillon Hobby Track, 177-D St-Jean Baptiste, Chateauquay, Quebec J6K 3B4; (514) 698-2151



Universal R/C Speedway, Niagara St., Welland, Ontario; (416) 735-5051



MEXICO

Hobby's Formula, Au observatorio 457, Mexico DF 01120; (905) 502-3620



R/C Baja Rosarito, Paraiso Ranch, Rosarito Beach, Baja California; 011,526-612-0495



JAPAN

Misawa R/C Raceway, 13th Fighter Squadron, PSC 76, Box 2585, APO AP 96139-2585; 011-81-176-53-5181, ext. 226-6506



SPAIN

ROARCR, Naval Station, Rota, Spain (P.O. Box 53, FPO NY NY 09540-0013); PO Kelly Sexton, 011-34-56-822652



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Mosi-Oa-Tunya, H9619 Highland Harare, Harare Country, Maslroland, Zimbabwe; 46237



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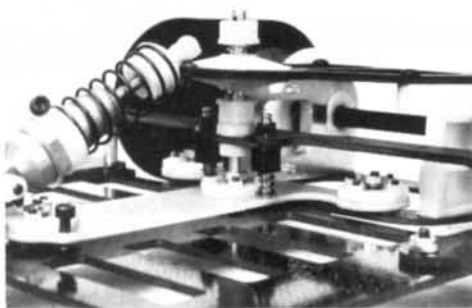
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LETTERS

(Continued from page 164)

know, that make decals that say what ya' want 'em to? If so, could you, like, tell me how to get in touch with 'em?

PETE LAMARA
Helena, MT

Well, Pete, if you, like, want some custom decals that, like, say what you want 'em to, why don't you, ya know, get in touch with R/C Graphix, 3235 Harms Way, Snellville, GA 30278; (404) 985-0755; Fax (404) 962-5881.

LA

BACK TO THE DRAWING BOARD

Is there a way to modify my JR-XT tranny so that it can compete against the cars that use Associated Stealth trannys? Does Losi have anything new on the drawing board?

BRETT PETERSON
Eagan, MN

You don't have to modify your Losi tranny, Brett, but adding a slipper clutch to it will help to keep you competitive. A slipper performs two functions: it allows

(Continued on page 182)

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LETTERS

(Continued from page 176)

you to adjust the amount of wheel spin accurately; and it prolongs the diff's life by reducing the strain on it.

Several after-market manufacturers offer slipper-clutch units for the Losi transmission. A&L Mfg.'s Power Clutch is one, and Team Losi has recently introduced its own "friction" slipper. It's similar to most slippers, yet it will allow you to use Losi's new Hydra-Drive fluid slipper when it becomes available. **FM**

HE BEGS TO DIFFER

I've only been into R/C cars for a year, and I have a few questions. What's the difference was between Trinity Pushed SCRs and inexpensive pre-assembled packs such as those offered by Kyosho. Is there a big difference in run time, charging time, or performance?

In the October "Letters," it said that you couldn't run a "hot" modified motor with the Futaba MC112B ESC. On the contrary, I've been running a Parma Cyclone II 13-turn motor with my Futaba ESC for about six months without any problems. I've used this combo in my RC10 Graphite and my Monster Beetle with 8.4 and 7.2V Duratrax batteries. When I use the 8.4V batteries, my ESC gets hot, but it doesn't burn out.

JOHN MELTON
Greenville, OH

There really isn't a much of a difference between a battery that has been pushed and matched and one that hasn't. Pushed packs have been "trained" to discharge at higher amperage rates with slight increases in voltage. When you become a proficient racer, i.e., you can race your car for 4 minutes without crashing frequently, then it may be time to buy some matched or even pushed batteries. Until then, stick with the less expensive batteries and work on your driving skills.

In the response to the letter in the October issue, the author states that "Although you can use the 112B with a hotter (less than 20 turns) motor, Futaba strongly advises against it." The circumstances under which an ESC is operated greatly affect its durability. Running the 112B in a monster truck with a hot modified is more likely to cause failure than running it in a car with a similar motor. The large truck tires put more load on the motor, so it draws more amps through the ESC and creates additional heat. Although your particular setup works, in general, it's not a setup that's recommended. **FM**

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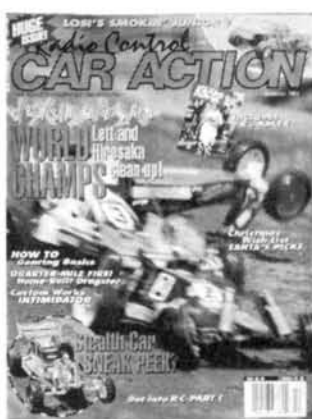
FEBRUARY '92

FEATURES: New for '92; Kyosho Honda NSR 500; Home-Built Project; Cobra Traxside Tire Truer; 25 Add-on Performance Parts; Project 10L Superspeedway; Welcome Home Race; Racing Servo Roundup; 1991 Roar-Legal Stock Motor Shootout; Sledgehammer Hop-Ups; Get Started In R/C, Part III
TRACK REPORTS: Traxxas TRX-1; Kyosho Lazer ZX-R; Hyperdrive Hyper 10 Cars; Associated RC12LW.



JANUARY '92

FEATURES: Reader's Ride of the Year; Time Warp; Tamiya Sand Scorchers; Home-Built Project; How to Build and Adjust Ball Diffs; Aristo-Craft Charger; Get Started in R/C, Part II; Track Directory; 1992 Catalogue Collection.
TRACK REPORTS: Kyosho Prototype XJ-220; Schumacher Nitro 10; McAllister Fly'n "M"; TRC/Compositecraft Lynx II Elite SS.



DECEMBER '91

FEATURES: Tech Tips; Get Started in R/C, Part I; Christmas Wish List; Gear It Up; Kyosho/Trinity 1991 IFMAR Off-Road World Champs; You Don't Have to Fight City Hall to Win; Home-Built Project; Radio Control Racer: Intro; Andy's R/C Products 1991 Roar On-Road Nats; Speed Shop; Post-Race Maintenance; How to Build a Diffmeter; Hot Tracks; Track Directory.
TRACK REPORTS: Bolink '91 Sport; Custom Works Intimidator; Team Losi Junior T; Serpent Tenforce.



NOVEMBER '91

FEATURES: Home-Built Project; Tekin Pro Dyno; Battery Blowout; Riding the Airwaves; Dynamic Damping; Radio Control Racer: New Section; 1991 TRC/Trinity ROAR Paved Oval Nats; IFMAR World Champs Cars; Car Action Interview: Cliff Lett; Project Lazer; Speed Shop; Track Directory; Associated RC10T Stadium Truck.
TRACK REPORTS: PB Sizzler; Parma Hemi Coupe.



OCTOBER '91

FEATURES: Keep Your Stocker Screamin'; World Champs Update; Home-Built Project: Pocket Racer; SP-10 Updates; Zero-Loss is Boss; Body Detailing; Project Bulldozerhead; West Coast Monster Race; Shinwa Operate.
TRACK REPORTS: Kyosho Testarossa; Kyosho Triumph; Pirate M1; Parma Days of Thunder; Corally SP-12.



SEPTEMBER '91

FEATURES: Home-Built Project: Classic Camaro; Lavco Pro Dyno; Avoid the Frequency Frenzy; Trinity Slot Machine; Painting Lexan Bodies; Wrood Wrecker; Car Action '91 Thunderdrome Preview; MRP Bud Light Tunnel-Hull Racer; Competition Electronics Stockcop; Off-Road Shock Tuning.
TRACK REPORTS: Associated Team Car; Kyosho Outlaw Rampage; Traxxas Blue Eagle; Radio Review: Airtronics Caliber 3P.



AUGUST '91

FEATURES: Inside Masami's Cars; Shinwa Motor Dresser Fet; R/C Facts & Fallacies; Home-Built Project: Primadonna Clod; Body Masking; IFMAR World Champs Preview; Kyosho's New Triumph; Pro-Line Ultima II Conversion; Winter Champs Winner; Pro-Line/Car Action Cactus Classic.
TRACK REPORTS: Kyosho Penske PC-19; Schumacher RS 4X4; Traxxas Hawk; Tamiya Manta Ray.



JULY '91

FEATURES: NORRCA/Mickey Thompson Grand Prix; Sneak Peek: Team Losi's Junior T; Home-Built Project: Flatbed Clod; Florida Winter Champs; Fusion Speed RC10; Battery Assembly Basics; Basics Of Differentials; Project Yokoma; Time-Warp: Tamiya XR311.
TRACK REPORTS: Tamiya Tyrrell 019 Ford; Corally SP-10; Schumacher Shotgun.

JUNE '91

FEATURES: Interview: Gil Losi, Jr.; Project King Cab: Heavy Metal Conversion; Car Of The Year; RC10 Tranny Makeover; Electric Flight Explosion; 20 Hot Motor Tips; Basics Of Glow Engines; MK Engineering Magnum.

TRACK REPORTS: TRC PRO 10 Sport; McAllister MX-PRO; Kyosho Turbo Ultima II.

JANUARY '91

FEATURES: Reader's Ride of the Year; Superspeedway Shootout—R/C Thunderdrome; Home-Built Project; Inside the Winning Thunderdrome Car; ERP Magnet Zapper; First Look: Team Losi JR-X-Pro; Connector Inspector; Five Years of Car Action; Candies, Flakes & Pearls; NORRCA Dirt-Oval Nats; NR/CTPA Truck Pulls; Hobby Lobby/Graupner Systems.

TRACK REPORTS: Tamiya Hi-Lux; Tamiya Super-G; Robbe Firefox; Marui Big Bear.

SEPTEMBER '90

FEATURES: Foot Soldier; Associated Three-Piece Rims; Interview with Joel Johnson; Project Indy; Hobby Dynamics Cesa Offshore Electric; Don't Be Counted Out; Home-Built Project; The Intimidator; Pro-Line JR-X2 Truck Conversion; Sassy's Tamiya 4WD Aluminum Chassis.

TRACK REPORTS: Kyosho Formula 1 Ferrari; Traxxas RTR Bullet; Composite Craft/TRC Lynx II.

MAY '90

TOP 10!

FEATURES: Top Ten Cars; Top Ten Drivers; Top Ten Accessories; Top Ten Pit Tips; Top Ten Reader Illustrations; IEDA Internationals; Building It Right, Part 4; Monster Truck Racing, Part II; Top Cat Modifications **TRACK REPORTS:** Kyosho Sideways; Kyosho Big Boss; Schumacher Pro Cat; Bolink Eliminator Gold.

MAY '91

FEATURES: How To Balance Wheels; Car Action's Top 10: Cars, Drivers, Tools, Tips; Florida Dirt Oval State Champs; Cleveland Indoor Champs.

TRACK REPORTS: Team Losi Junior Two; Kyosho Burns DX; Associated Superspeedway 10L; Cox GTP Nissan.

DECEMBER '90

FEATURES: Christmas Wish List; Inside Cliff Lett's Winning Cars; Speedworks Sportman's Cup; Madcap Truck Conversion; Houge RC10 Conversion; NORRCA Off-Road Nats; ROAR Off-Road Nats; Catalogue Collection; Build a T-Bucket; Off-Road Wheel Roundup; Shock Waves.

TRACK REPORTS: Associated RC10 Championship Edition; Composite-Craft/TRC Lynx II Sport; Traxxas TRX-T Eagle.

AUGUST '90

FEATURES: Days of Thunder; Budget Modified Motors; Speedworks Sportsman's Cup Race; Inside Dobson's Car; Battery Dumping; Hot Rod Magazine R/C Nats; The Lavco System; Robbe Scarab; Basic Soldering.

TRACK REPORTS: Panda Stadium Racer; Hirobo Toyota Celica GT Four; Max Trax Wedge; Tamiya Thunder Dragon QD.

FEBRUARY '90

WORLD CHAMPS!

FEATURES: Building It Right, Part 3; Tamiya Astute Preview; C&M 1/8-Scale Cobra Preview; '89 IFMAR Off-Road World Champs; NORRCA Dirt-Oval Nats; King 8 Supernationals; Supermodified Pullers; New For '90; QSAC Nationals; Astro Drag Set-Up; Roots of R/C, Part II; Aristo-Craft Motor Conditioner; Project Sprinter.

TRACK REPORTS: WCM Supermodified; Hirobo Invader; Inter-Fab Viper Pro-10; Lazer Lite Quick-Change Shadow.

MARCH '91

FEATURES: RC10 Hyperdrive; New for '91; Second-Look Series: Optima Mid; Project Lynx; Kyosho 1/8-Scale World Challenge; How To Make a Winning Concours Interior; First Look: Tamiya Bullhead; Speedworks Sportsman's Cup; NR/CTPA World Championships; MIP's 4WD RC10, Part II; MRP Miss Budweiser.

TRACK REPORTS: Kyosho Porsche 911; Schumacher Cougar.

NOVEMBER '90

FEATURES: 1990 JG Oval Nats Winners; On-Road Turbo Ultima; Project Clod Buster; Masami's Yokomo; Magic Motorsports Commutator Machine; JG YZ-10 Truck Conversion; Home-Built Project: Coca-Cola Dominator; JG Lazer Truck Conversion; Home-Made Tire Truer; Preview: Tamiya Ferrari F189; Second-Look Series: Kyosho Raider; MRC Nordic.

TRACK REPORTS: Kyosho USA-1; Kyosho Ultima II; Tamiya Saint Dragon.

JULY '90

FEATURES: Bullet Racing RC-X2; Project Master Blaster; Kyosho 1/8-Scale Off-Road Challenge; Great Planes Marine Stinger; Inside the Winning Truck; Competition Electronics Linear Turbocharger; ROAR Truck Nationals; Project 10L.

TRACK REPORTS: Kyosho Slingshot; Tamiya Egress; Associated RC10L; Team Losi JR-XT.

FEBRUARY '91

FEATURES: Time Warp: Tamiya B2B Sidecar; ROAR 1/8-Scale Nats; Holedshot; RC10LTO; Kyosho Hurricane; Kalt Whisper; Custom-Cut Graphics; Modified Motor Maintenance; Second-Look Series: Associated 10L; MIP's 4WD RC10, Part I; Canadian Off-Road Nats.

TRACK REPORTS: Team Losi JR-X-Pro; Tamiya Ferrari F189; Kyosho Ultima Outlaw.

OCTOBER '90

FEATURES: RoboTruck; Roar Paved Oval Nats; Roar Dirt Oval Nats Winners; Centered Energy; Bloomington Gold R/C Corvette Challenge; Trinity's New Tamper-Proof Stock Motor; Kyosho Jet Stream GP-10; Secrets of the Dominator; On-Road JR-X2; 7th Annual JG Oval Championships; Dirt-Oval Buyers' Guide; Sideways City Super 50 Speedway.

TRACK REPORTS: Traxxas Radicator; Kyosho Turbo Burns; Associated RC10 Graphite.

JUNE '90

CAR OF THE YEAR!

FEATURES: Car of the Year; Home-Built Project; Twister Mini Lathe; Monolithic 35Q Power Supply; GR Winter Champs; High-Octane RC10; K/N Winterblast; Clod Pulling Modifications; Tekin Reflex Charger

TRACK REPORTS: Tamiya Madcap; Traxxas Bullet; Kyosho Turbo Raider.

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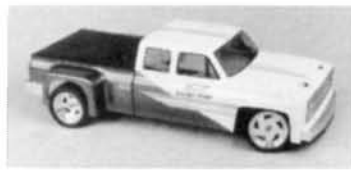
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TOWER HOBBIES 1992 Annual Catalog

The Tower Catalog has been updated for 1992. The industry's primary source of product information, the award-winning Catalog is the "bible" of R/Cers worldwide. This giant, 288-page edition includes more than 10,000 items (from more than 300 manufacturers), reference charts, helpful hints and "how-to" information.

For more information, contact Tower Hobbies, P.O. Box 9078, Champaign, IL 61826; (800) 637-4989.



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For more information, contact TMS Products, 1840 W. 220 St., Unit 360, Torrance, CA 90501; (213) 320-1946.



TRINITY PRODUCTS Zip Pack Sport Battery Pack

Trinity's 6-cell sport battery pack is made of high-output, super-durable Panasonic cells. They can withstand repeated charging without a serious performance loss. The pack comes with a Tamiya-style connector.

Part no. RC 5889

Price: \$19.99

For more information, contact Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.



MINICRAFT Universal Variable-Speed Transformer

Minicraft's top-of-the-line transformer improves the performance of all Minicraft power tools. The Universal Variable-Speed Transformer combines the power, reliability and safety features that are demanded by serious hobbyists and professional craftsmen. Its output ranges from 50 volts constant to a peak of 100 volts, and its speed controller ranges from 500 to 30,000rpm. Its primary voltage is 120 volts, 60Hz. Its overload cut-off ability can be reset, and this extends the lifespan of the transformer and the power tools.

Part no. MB750

Price: \$89.95

For more information, contact Minicraft, 1 Perfection Dr., Ridgely, MD 21685.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Radio Control Car Action**, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Radio Control Car Action**.

WHAT'S NEW

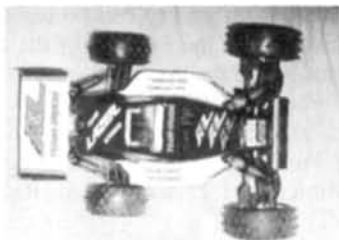


McALLISTER RACING '51 Mercury Cruiser

This '51 Merc is the ultimate classic chopped-top. McAllister Racing presents this classic with all the famous details, e.g., fender skirts and clean custom front-end treatment. McAllister also offers the pro stock version, which will soon be seen on drag strips nationwide!

Part nos. B-158 ('51 Mercury Cruiser); B-159 ('51 Mercury Pro Stocker).

For more information, contact McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.



A&L MANUFACTURING Blaze-Runner Body for the Lazer

It's easy to mount this single-seater Lexan body to the 4WD Kyosho Lazer, because you don't have to cut around the gear cover. Its built-in number plates make it look good at the track, and they eliminate the need for decals in the window area. A&L also offers an aerodynamic Lexan belly-pan for the Blaze-Runner body.

Part nos. 9504 (body); 9505 (belly-pan).

Prices: \$15.50 (body); \$10.75 (belly-pan).

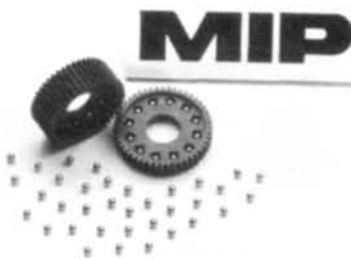
For more information, contact A&L Mfg., 505 N. Smith, Unit 105, Corona, CA 92710.



FUTABA 3UCP 3-Channel Super System

Futaba's new system includes an R113IP/PCM 1024 receiver, two S9301 servos and a T3UCP transmitter. It has a six-model memory with car and boat software. Available in 27 and 75MHz, it features an LCD computer screen, ATV, ATL, dual rates, exponential, programmable mixing, a timer, one-touch key programming, servo reversing and a plug-in radio-frequency module. It's also available with S132H servos.

For more information, contact Futaba Corp. of America, 4 Studebaker, Irvine, CA 92718.



MIP Super Carbide Diff Balls

MIP's $3/32$ -inch super carbide diff balls are the hardest carbide balls around. Accurate to 2 hundred-thousandths of an inch, these top-rated balls ensure smooth diff action and a longer diff life.

Part no. SC-100

Price: \$13.95/set of 12

For more information, contact MIP, 838 E. Edna Pl., Covina, CA 91723.



KYOSHO Chevy Sport Truck

This $1/10$ -scale Chevy Custom Sport 2WD electric lets you choose your own look—from mildly customized to totally wild. The Chevy S-10 body is equipped with air dams, door mirrors, wipers, a rear spoiler and a visor. Other options, such as a bed wing and two sets of colorful decals, are included with the kit. A durable Kelron chassis, double-wishbone suspension, LeMans stock 05 motor, heavy-duty speed controller, and a sealed gearbox provide superb on-road performance.

Part no. KYOC0159

Price: \$219.95

For more information, contact Great Planes Model Distributors, 1608 Interstate Dr., Champaign, IL 61820.



McALLISTER RACING Chevy Intrepid

Put the heartbeat back into your $1/12$ -scale car collection with the hottest new car on the IMSA GTP circuit—the McAllister Racing Chevy Intrepid.

Part no. B-97

For more information, contact McAllister Racing, 2245 First St., Unit 105, Simi Valley, CA 93065.



BADGER MODEL 150

BOTTOM FEED DUAL ACTION INTERNAL MIX

The Badger Model 150 is the choice when fine line, smooth action, delicate detailing and shading are required. The 150 will spray railroad and hobby paints, acrylic enamel, lacquers, water colors and Air-Opaque air-brush colors. The 150 offers a choice of three reservoirs: 1/4 oz. color cup, 3/4 and 2 oz. paint jars. The 150 adapts to three different heads, (F) extra-fine, (M) medium and (L) heavy. This gives you the versatility to spray any type of material. The dual action feature allows you to change the width of spray and the opaqueness of the paint without stopping your hand movement. Internal mix air-brushes produce a thoroughly atomized (smooth) fine dot spray.



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